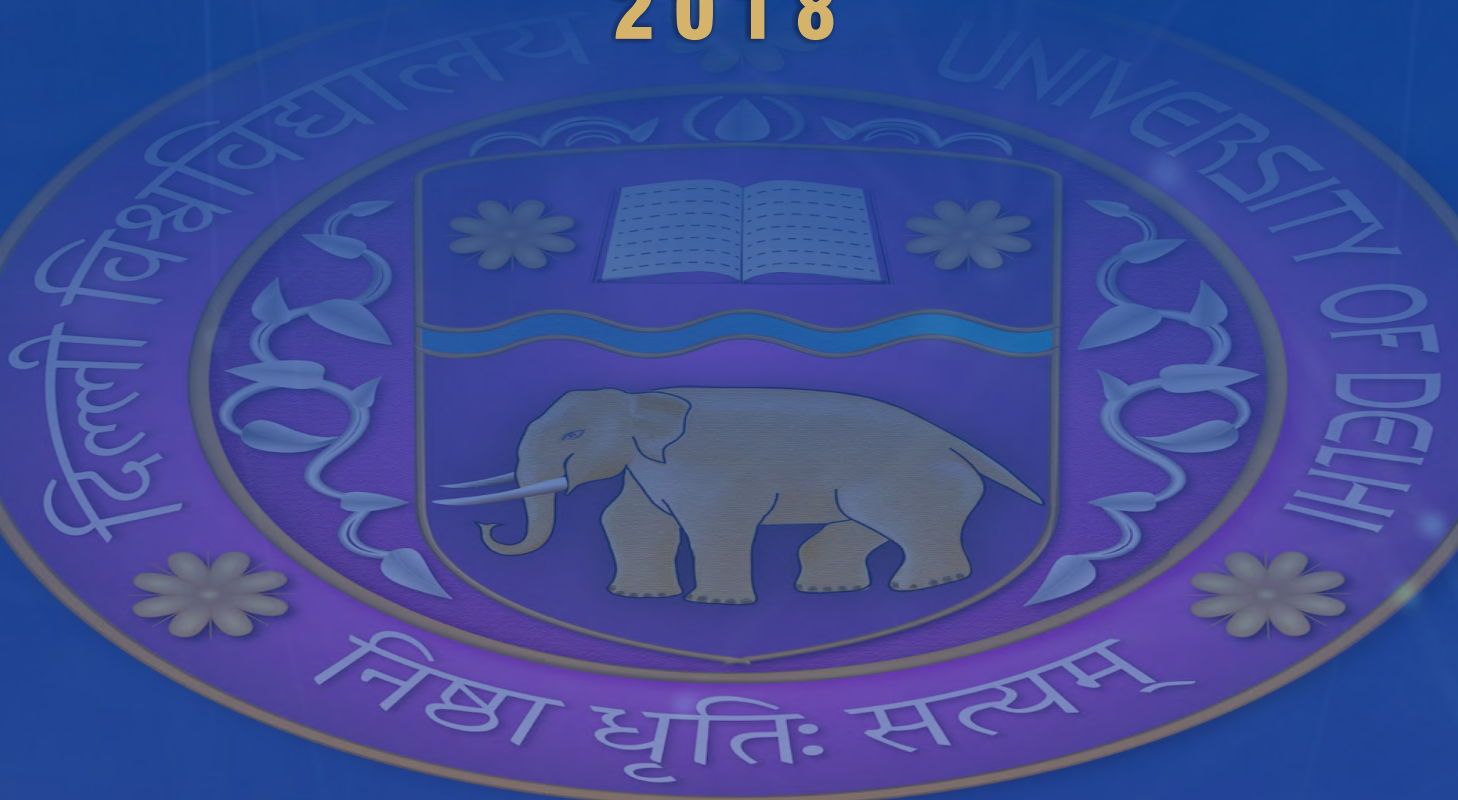




UNIVERSITY OF DELHI

# RESEARCH PROFILE

## 2018





# **Research Profile**

**University of Delhi**

**Best Practice - I**

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## 1. Introduction

The University of Delhi revels in holding illustrious standards of research in the country with eminent faculty to match the best in the world. It is a research-intensive university that seeks to create and share knowledge and technical knowhow through quality research for the benefit of society and humanity. While it is not possible to quantify the value of significant inputs that go into research at the university, some of the measurable/deliverables include funds received from extramural sources, research grants, research-based course curricula, research supervision by faculty and the number of students enrolled in postgraduate and doctoral programmes. Output on the other hand constitutes quality publications, patents, consultancy, MoUs, citations, distinguished awards/honours received by faculty and research scholars, and diverse research products and processes that enhance the quality of life and well-being of the society at large.

### Research Highlights

**h-index and Publications:** The University has an impressive h-index of **164** (based on Scopus database), which is one of the highest among Indian Universities. Total number of publications during 2012–2017 was 10,274.

**Research Grants:** Being a research-intensive university, the University of Delhi promotes the strengthening of research infrastructure and innovation culture by exploring novel paradigms to address societal, national and global challenges. The University's strong commitment to excellence in research is reflected by perusal of its funding from extramural sources which amounts to more than Rs. 300 crores in the last five years.

**Undergraduate Research in the University:** The University holds distinction in initiating undergraduate research programmes through research grants, travel grants and by bringing out an online Journal of Undergraduate Research and Innovation. These initiatives have played a significant role in developing interdisciplinary research culture in the colleges and have facilitated integrative learning.

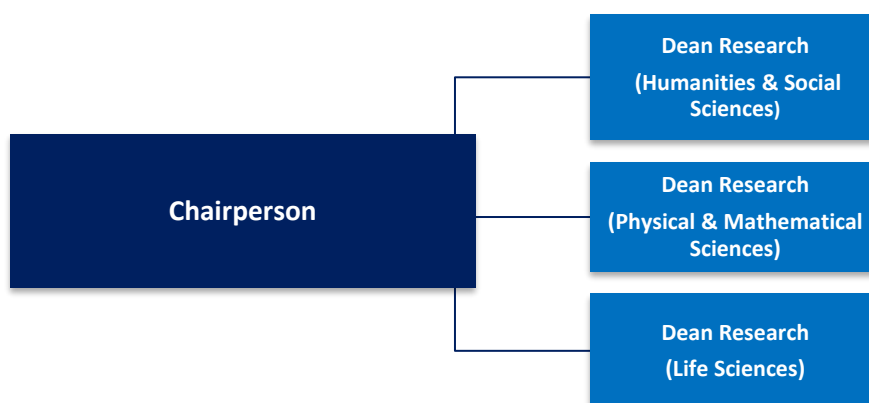
**Eminent Research Faculty:** Every year there is an extensive list of research faculty who received extramural grants of more than rupees one crore. These are received by them on competitive basis and on account of the prestige and importance of their research in the global context. This has resulted in several path-breaking outcomes, which have led to significant advances in the existing knowledge base. Apart from resulting in prestigious publications with high impact factor, the research outcomes of these initiatives have also included innovative applications that have permeated the larger public domain and have enhanced the societal well-being.

**Awards, Collaborations, Conferences:** The outstanding body of research work done in the University has been duly rewarded with several national and international recognition and awards. Faculty members are also recipients of the most prestigious international and national research fellowships. The University has partner universities across the world with which student/faculty exchange programmes and active collaborations for research are strongly encouraged.

## 2. Research Council











The University has established a Research Council, which coordinates and facilitates research activities of the diverse constituent units of the University. The Chair of the Research Council, together with the Deans, (Research) play an active role to augment the research work of the University. Based on their specialization, they look after various faculties and departments.

### Composition of Research Council:





## Objectives of Research Council

-  To enthuse an active research culture in the University
-  To provide overall guidance to Ph.D./M.Phil. Programmes and related ordinances
-  To frame guidelines and provide assistance for availing and utilization of intramural research grants
-  To facilitate intramural grants and fellowships
-  To provide guidance on issues related to utilization of extramural grants
-  To support undergraduate research in colleges
-  To publish e-Journals for college students and faculty
-  To ensure that ethics guidelines are followed
-  To facilitate activities related to Intellectual Property Rights, Patents
-  To facilitate the process of signing National MoUs

## **Faculties/Centres under Deans Research**

### **Dean Research (Humanities & Social Sciences)**

- Faculty of Applied Social Sciences & Humanities- Business Economics
- Faculty of Arts- Arabic, Buddhist Studies, English, Germanic & Romance Studies, Hindi, Library & Information Science, Linguistics, Modern Indian Languages and Literary Studies, Persian, Philosophy, Psychology, Punjabi, Sanskrit, Urdu, Slavonic & Finno-Ugrian Studies
- Faculty of Commerce & Business Studies- Commerce, Financial Studies
- Faculty of Education- Education
- Faculty of Law
- Faculty of Management Studies- Business Management & Industrial Administration
- Faculty of Music & Fine Arts
- Faculty of Social Sciences- Adult, Continuing Education & Extension, African Studies, East Asian Studies, Economics, Geography, History, Political Science, Social Work, Sociology
- Delhi School of Economics
- Open Learning- Distance and Continuing Education
- Centre for Professional Development in Higher Education
- Agricultural Economics Research Centre
- Women's Study Development Centre

### **Dean Research (Life Sciences)**

- Faculty of Ayurvedic & Unani Medicine
- Faculty of Homeopathic Medicine
- Faculty of Interdisciplinary & Applied Sciences- Biophysics, Biochemistry, Electronic Science, Genetics, Microbiology, Physical Education and Sports Sciences, Plant Molecular Biology
- Faculty of Medical Sciences
- Faculty of Science- Anthropology, Botany, Environmental Studies, Home Science, Nursing, Pharmacy, Zoology
- Dr. B. R. Ambedkar Centre for Biomedical Research
- Centre for Inter-disciplinary Studies of Mountain & Hill Environment
- Centre for Environment Management of Degraded Ecosystem

### **Dean Research (Physical & Mathematical Sciences)**

- Faculty of Mathematical Sciences- Computer Science, Mathematics, Operational Research, Statistics

- Faculty of Science- Chemistry, Geology, Physics & Astrophysics
- Faculty of Technology- Civil Engineering, Computer Engineering, Electrical Engineering, Electronics & Communications Engineering, Instrumentation & Control Engineering, Mechanical Engineering, Production & Industrial Engineering
- Institute of Informatics and Communication
- Cluster Innovation Centre
- Centre for Science Education & Communication
- Physical Education & Sports Science
- Institute of Lifelong Learning

### **3. Research Parameters**

#### **3.1 M.Phil. and Ph.D. Programmes**

Ordinance VI defines the procedure for award of Master of Philosophy (M.Phil.) and Doctor of Philosophy (Ph.D.) degrees. The Ordinance conforms to the University Grants Commission Gazette (minimum standards and procedure for award of M.Phil. / Ph.D. degrees) regulations 2016 (**Annexure I**). A Professor can guide up to eight doctoral students and three M.Phil. students. An Associate Professor can guide up to six doctoral students and two M.Phil. students. An Assistant Professor can guide up to four doctoral students and one M.Phil. student. The average number of M.Phil. and Ph.D. students guided by each permanent faculty of the University is decided accordingly.

#### **Measures undertaken to check plagiarism**

The University has a rigorous process for upholding academic integrity in its publications. Submitted reports and research papers are screened for plagiarism using anti-plagiarism software **Turnitin** and **Urkund** (provided by UGC). Each department has been given an individual login and every Ph.D. and M.Phil. thesis is screened and checked through the software for plagiarism before submission. The facility has also been made centralized with the Central Library and the South Campus Library, helping students and faculty members desirous of submitting thesis and submitting papers for publication with the plagiarism check through these software. The scholars have to submit the soft copies of their thesis to the library, which uses the requisite software to check plagiarism. A certificate is provided by the library along with a copy of the report, authenticating that the work is original and is free

from plagiarism. The certificate has to be submitted by the scholar at the time of submission of the thesis. **Please see Annexure II for details.**

Ph.D. Scholars in the University avail one of the research fellowships such as UGC, CSIR, and RGNF.

### **Research fellowship profile of Ph.D. scholars in the University (2012-2017)**

<b>Year</b>	<b>UGC – CSIR JRF/SRF</b>	<b>RGNF*</b>	<b>MANF**</b>	<b>NON-NET</b>	<b>Total</b>
2012–2013	362	31	11	486	890
2013–2014	277	18	06	572	873
2014-2015	337	18	04	622	981
2015-2016	297	54	14	704	1069
2016-2017	362	26	07	670	1065

\*RGNF-Rajiv Gandhi National Fellowship, \*\*MANF- Maulana Azad National Fellowship

### **Ph.D. awarded (except Faculty of Technology, Faculty of Medical Science, Department of Home Science and Department of Pharmacy) in the last five years (2012-2017): 2593**

<b>Department</b>	<b>2012–13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016–17</b>
Faculty of Arts	110	108	176	152	115
Faculty of Social Sciences	26	51	72	80	46
Faculty of Mathematical Sciences	26	25	29	35	42
Faculty of Commerce & Business studies	14	12	31	15	26
Faculty of Applied Social Sciences & Humanities	6	4	3	3	8
Faculty of Science	119	151	180	187	165
Faculty of Inter-Disciplinary & Applied Sciences	30	31	75	70	41
Faculty - Other	63	41	71	90	64

### **Shodhganga- Depositing Ph.D. theses with INFLIBNET**

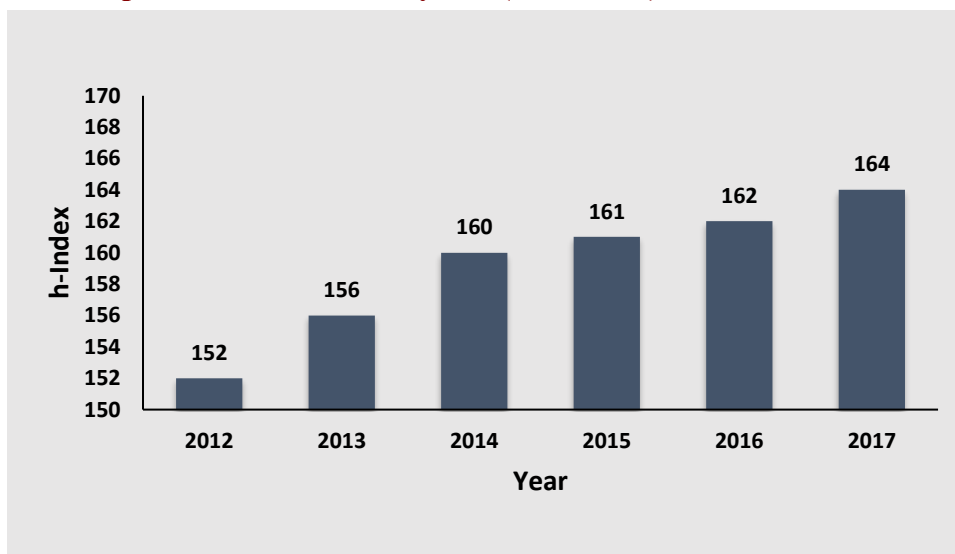
The University of Delhi has signed a Memorandum of Understanding under the *Shodhganga* project with UGC-INFLIBNET for electronic submission of theses which are later made available online. *Shodhganga* is a repository of Indian Electronic Thesis and Dissertations

(ETD) that requires compulsory submission of the thesis online. The University submits soft copies of thesis to INFLIBNET for uploading in the *Shodhganga* repository from 2009.

### 3.2 Research Publications and h-Index

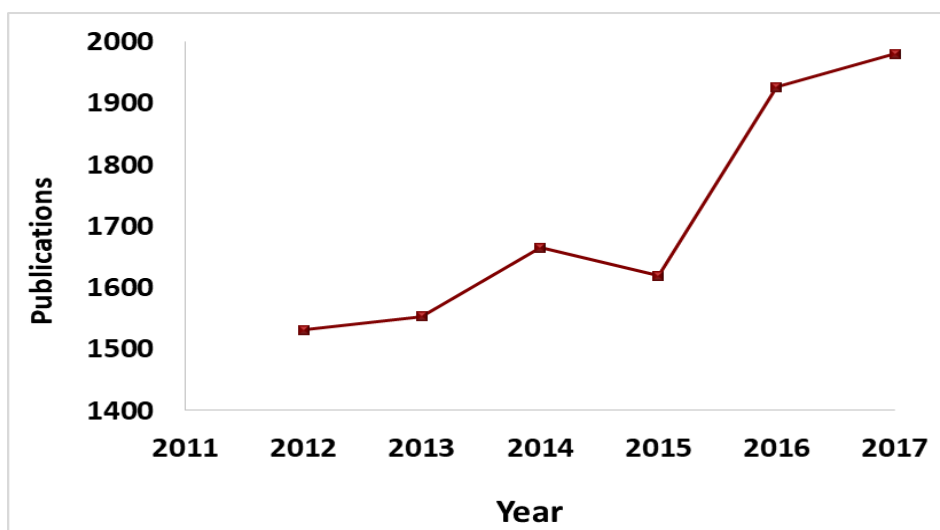
Given the prolific research base of the University, the “h-index” of the University, **as per Scopus database, is 164**, one of the highest among Indian Universities. The total number of publications in the period 2012-2017 are 10,274 which include research articles, reviews, conference papers, books, chapter in books, notes and several articles in press.

#### **h-Index profile in the last five years (2012-2017)**



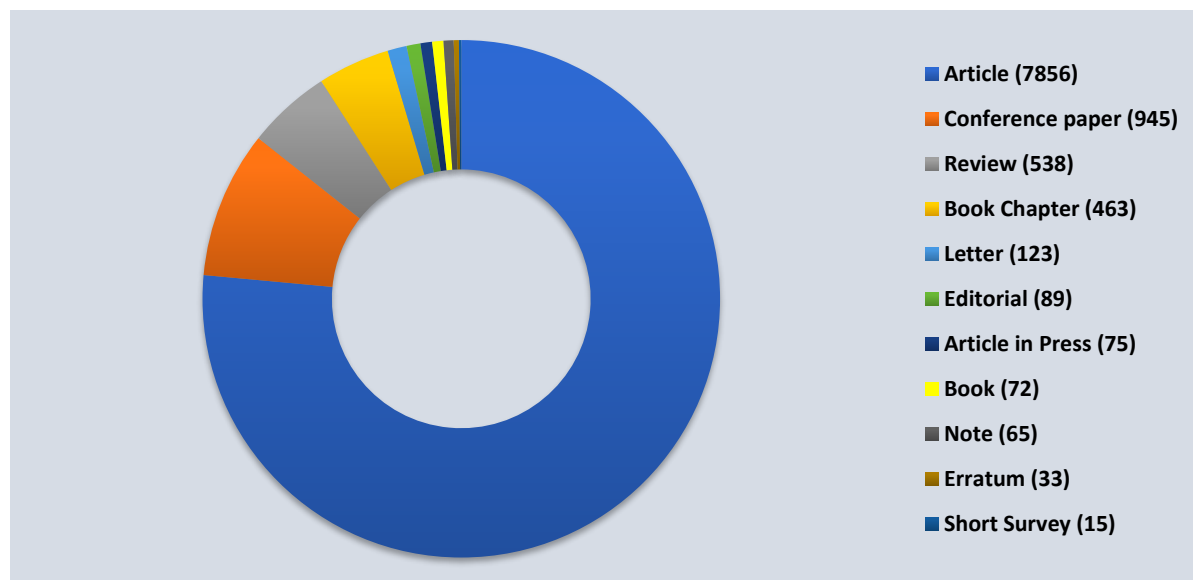
Scopus Database

#### **Number of research papers published per year (2012- 2017)**



Scopus Database

### Publications by type (2012- 2017)



Scopus Database

### Department-wise publications (April, 2012-March, 2017)

S.No.	Department	Papers Published in Peer Reviewed Journals	Books, Chapters in Edited Volumes/Books and Papers in Conference Proceedings
1.	Business Economics	23	8
2.	Arabic	30	18
3.	Buddhist Studies	116	14
4.	English	72	79
5.	Germanic and Romance Studies	16	70
6.	Hindi	97	45
7.	Library and Information Science	84	23
8.	Linguistics	18	23
9.	Modern Indian Languages and Literary Studies	6	29
10.	Persian	13	4
11.	Philosophy	21	31
12.	Psychology	25	13
13.	Punjabi	12	34
14.	Sanskrit	183	53
15.	Slavonic and Finno-Ugrian Studies	48	6

16.	Urdu	60	61
17.	Commerce	137	74
18.	Financial Studies	59	3
19.	Education	74	80
20.	Bio Physics	28	1
21.	Biochemistry	98	3
22.	Electronic Science	147	30
23.	Genetics	99	11
24.	Institute of Informatics and Communications	5	0
25.	Microbiology	137	35
26.	Plant Molecular Biology	208	28
27.	Law	127	65
28.	Business Management and Industrial Administration (FMS)	164	37
29.	Computer Science	89	98
30.	Mathematics	175	5
31.	Operational Research	172	13
32.	Statistics	102	0
33.	Music	62	10
34.	Anthropology	272	25
35.	Botany	233	61
36.	Chemistry	1215	42
37.	Environmental Studies	86	2
38.	Geology	153	9
39.	Physics and Astrophysics	1592	118
40.	Zoology	304	20
41.	Adult, Continuing Education and Extension	60	25
42.	African Studies	14	25
43.	East Asian Studies	15	32
44.	Economics	59	57
45.	Geography	50	65
46.	History	67	136
47.	Political Science	61	79
48.	Social Work	68	88
49.	Sociology	63	66
50.	Dr. B.R. Ambedkar Centre For Biomedical Research	181	8
51.	Cluster Innovation Centre	62	27
	<b>Total</b>	<b>7262</b>	<b>1889</b>

SSR Data

*Research findings of many faculty members have been highlighted in the front cover of the most coveted Journals*



### 3.3 Faculty Members Serving as Members of Editorial Boards

Several faculty members of the University are serving on the editorial boards of national and international journals by virtue of their achievements in their fields of expertise. More than 250 faculty members of different departments are serving on editorial boards of about 450 national/international journals. Many of them serve on the editorial boards of more than one journal in various editorial capacity.

**250+ Faculty members are in the editorial board of 450+ National/International journals**

### 3.4 Research Grants

The research grants in the University are obtained from several national and international funding agencies. Besides, the University also has schemes for research grants to support and strengthen the teaching and research community and the undergraduate students.

## Research Grants

**University Research Grants**

**Sponsored Research Grants**

**R & D Grant for the  
Departments**

**Innovation Projects  
for Colleges**

**National**

**International**

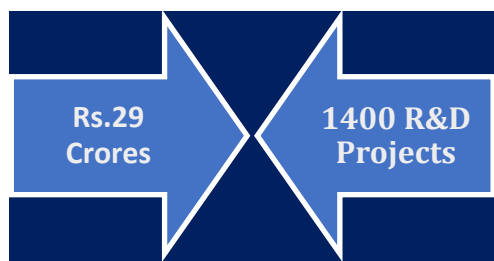


### 3.4.1 University Research Grants

The University has its own research grants which have gone a long way in fostering a research culture, at the Department level through its scheme of Research and Development (R & D) grant and at the college level through the Innovation Projects.

#### Research & Development Grant (R&D)

R & D grant was instituted by the University to bolster the ongoing research Programmes across departments. Faculty members of the Science departments were given up to Rs. 3.0 lakhs and those of Non-Science departments up to Rs. 1.5 lakhs based on research projects submitted by them subject to availability of funds. A screening process was undertaken for selecting research projects submitted by the faculty members which involved evaluation by experts in the subject areas. The sanctioned projects were also periodically assessed for the outcomes and the quality of publications that the grant supports. The funding has been very helpful to the faculty members desirous of continuous engagement in research and has resulted in enhancement in the research profile of the University. In the last few years more than 1400 R & D projects (based in the departments) worth Rs. 29 crores have been awarded.



#### R & D Grants of the University

Year	No. of Research Projects	R & D Grant (Rs. in Crore)
2012-2013	332	6.3
2013-2014	324	7.2
2014-2015	336	6.6
2015-2016	387	8.1

### Research Grant for Innovation Projects for Colleges (Undergraduate)

A first scheme of its kind in the country, popularly known as ‘Innovation Projects for Colleges’, was initiated in 2012, with an aim to promote undergraduate and interdisciplinary research through University funding. The thrust of this progressive and highly successful venture has been to develop a conducive environment for research in colleges and inculcate innovative thinking in students. The scheme was structured to encourage and support hands-on trans-disciplinary research which promotes synthesis of ideas and integrative learning and helps lead college students and teachers to move beyond subject boundaries.



Making a sizeable impact, the scheme has facilitated the University to fund 679 projects with a grant of Rs. 36.39 crores. The outcomes of this initiative have resulted in a vibrant research culture at the undergraduate level with the enthusiastic participation of over 2,000 teachers and around 8,000 students. Many projects have received media attention for their impact on the society and their innovative outcomes. As many as 14 books and 128 peer-reviewed publications have been completed, 6 patents have been filed and 375 presentations in conferences have been made.

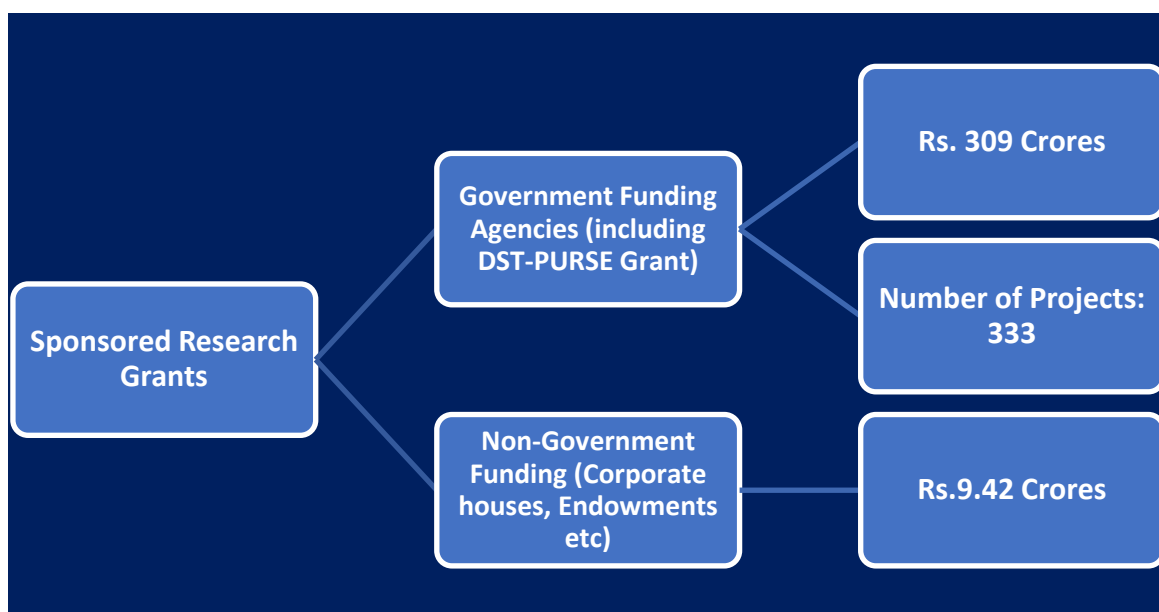
### Participants in Innovation Projects:



### 3.4.2 Sponsored Research Grants

To reiterate, high quality research activities are extensively promoted by the University. Faculty members are encouraged and facilitated to apply for research grants from various extramural sources. As a result of its efforts to augment resource mobilization, the University has been receiving funding from a large number of international and national bodies. Guidelines for sponsored research grant are covered in **Annexure III**.

#### Summary of the grants received by the University (2012-2017)



#### DST-PURSE Grant

As an impact of its outstanding research initiatives, publication record and high “h-index”, the University of Delhi is the recipient of the highest DST-PURSE grant received by any University in the country. The grant for the Phase-II (2014-2019) was Rs. 40.80 Crores. The grant has benefitted more than twenty Science departments and helped with enhancement of basic research facilities, central instrumentation facilities and high-quality research at the University.



**Faculty members with grants of more than Rs. 1 Crore in 2016-2017**

S. No	Name of the Faculty	Department	Funding Agency	Amount (Rs.in Crores)	Year
1.	Prof. A.K. Pradhan	Plant Molecular Biology	DBT	4.87	2016-2017
			DBT-UDSC	11.88	2016-2017
2.	Prof. Akhilesh K. Tyagi	Plant Molecular Biology	DBT-NIPGR	1.96	2016-2017
3.	Prof. Anil K. Tyagi	Biochemistry	DBT	4.85	2012-2017
4.	Prof. Arun K. Sharma	Plant Molecular Biology	DBT	1.31	2016-2017
5.	Prof. B. Biswal	Cluster Innovation Centre	MHRD	1.70	2016-2017
6.	Prof. B. K. Thelma	Genetics	DBT	5.72	2016-2017
			SERB-DST	15.7	2016-2017
7.	Prof. C. R. Babu	CEMDE	DDA	5.79	2016-2017
8.	Prof. Deepak Pental	Genetics	DBT-BBSRC	1.89	2016-2017
9.	Prof. J. P. Khurana	Plant Molecular Biology	DBT	1.38	2016-2017
10.	Prof. M. V. Rajam	Genetics	DBT	1.56	2016-2017
11.	Prof. Sanjay Kapoor	Plant Molecular Biology	DBT	1.31	2015-2016/2016-2017
			DBT	1.67	2015-2016/2016-2017
			DBT	1.88	2015-2016
12.	Prof. Swati Saha	Microbiology	DBT	1.82	2016-2017
13.	Prof. V. K. Chaudhary	Biochemistry	DBT	1.14	2016-2017
14.	Dr. Vipin Gupta	Anthropology	DBT-Welcome trust	3.81	2016-2017

**Number of faculty members with grants of Rs.10 Lakhs or more in 2016-2017: 72**

## Extramural research grants from various National and International funding agencies

National	National	International
DBT	GAIL	World Bank
DST	IUAC	Indo-USSTF
IFICAR	ICSSR	Univ. of Norway
UGC	MCIT	Univ. of Turkey
MOEF	NUST	Japan Foundation
IAEA	ISRO	Leverhulme Trust UK
ICAR	SDTT	
DRDO	VIGYAN PRASAR	
CSIR	SERB-DST	
MOES	SEWA-THDC	
ICMR	MOSJ&E	
MNRE	DAE	
TERI	MWCD	
INSA	ICHR	
TISS		

Several departments in the University have also been recognized for their research activities by National and International agencies and receive financial assistance. These are as follows:

### Departments with Fund for Improvement of S&T (DST-FIST):

- Anthropology
- Biochemistry
- Botany
- Chemistry
- Genetics
- Geology
- Mathematics
- Physics & Astrophysics
- Plant Molecular Biology
- Zoology

### Departments with Financial Assistance under UGC/UGC SAP

#### Departmental Research Support (DRS)

- Anthropology
- Biochemistry
- Dr. B.R. Ambedkar Centre for Bio-Medical Research
- Germanic and Romance Studies

- Geography
- Genetics
- Hindi
- Modern Indian Languages and Literary Studies

- Persian
- Plant Molecular Biology
- Psychology
- Microbiology

### **Department of Special Assistance (DSA)**

- English
- Music & Fine Arts
- Mathematics

### **Centre of Advanced Study (CAS)**

- Buddhist Studies
- Chemistry
- Economics
- History
- Linguistics
- Social Work
- Sociology
- Zoology

### **Area Studies Programme (ASP)**

- African Studies
- Centre for Canadian Studies
- Developing Countries Research Centre
- East Asian Studies

### **3.5 Undergraduate Research in the University**

The University of Delhi has a unique distinction of encouraging research at the undergraduate level. Several initiatives have been taken to introduce undergraduate (UG) students to demands and rigour of research, which include the following:

- Dedicated Research Grants to fund Innovation Project scheme
- Travel Grant to students
- Publication of an e-journal for undergraduate research and innovation

The systematic integration of research experience in undergraduate Programmes has not only lead to research-based learning in the academic disciplines across institutions and encouraged an inter-disciplinary approach in problem solving, but has also provided the opportunity to articulate and publish the research findings. The projects cut across disciplines and focus on solutions to problems and challenges faced by society, nation and the world.

#### **3.5.1 Innovation Projects**

The scheme of Innovation Projects has been highly successful in inculcating innovative thinking in students. The scheme was structured to encourage and support hands-on inter-disciplinary research by college teachers and students. The selected projects undergo a thorough half-yearly assessment and appraisal to track progress. Each project has three teachers and ten students and a mentor from outside the institution. External as well as internal experts rigorously screen project proposals for selecting the most promising ones. Grants are given subject to availability of funds.

So far, 679 projects worth Rs. 36.39 crores have been supported. The outcomes of this initiative have resulted in a vibrant research culture at the undergraduate level. As many as 14 books and 128 peer-reviewed publications have been completed and 6 patents have been filed.

#### **3.5.2 Travel Grants to students for attending International Conferences / Workshops / Summer School / Winter school / Short term training**

In order to encourage the students to attend international conference/workshop/summer and winter school to present their research work, or to undertake short term training, the

University extends partial financial support towards air fare and registration fees, subject to availability of funds. Applications are approved, based on the merit of student/quality of research paper/poster presentation; importance of conference/workshop and the relevance of the summer/winter school, workshop or training programme to student's academic growth.

### **3.5.3 Research Journal: *The Delhi University Journal of Undergraduate Research and Innovation*** (ISSN: 2395 - 2334)

The journal is an online bi-annual peer reviewed research journal that publishes articles based on original research work from research projects funded by the University or from external agencies. Further details can be obtained on the journal website <http://journals.du.ac.in/ugresearch>

## **3.6 Interdisciplinary Research**

**Interdisciplinary Research** is in-built into the structure of the University where various departments and centres collaborate for interdisciplinary research initiatives. Several schemes, courses and research journals have been initiated with an aim to strengthen the interdisciplinary and collaborative research culture in the University. These include the following:

- **Interdisciplinary Faculties:** The University has two designated faculties for Interdisciplinary Studies-
  - i) The **Faculty of Interdisciplinary & Applied Sciences** is equipped with state-of-the-art research facilities comparable to the best globally in areas of Plant Molecular Biology, Genetics, Biochemistry, Microbiology and Biophysics. The research profile of the faculty is prolific and internationally acclaimed.
  - ii) In the **Faculty of Applied Social Sciences & Humanities**, the constituent department offer courses and conduct cutting-edge research in interdisciplinary areas. Faculty members collaborate with various national and international institutions on several interdisciplinary research areas.
- **Interdisciplinary Centre:** The University has a **Cluster Innovation Centre** that offers courses in interdisciplinary areas with a focus on innovation and research. It also gives impetus to the application of research in the form of entrepreneurial initiatives. A conducive



environment has been created to encourage collaboration with industry and private organizations.

- **Interdisciplinary Undergraduate Research:** The undergraduate research promoted by the University through the **Innovation Project scheme** is interdisciplinary in nature. Each project team consists of faculty members and students from different disciplines, which enables integrative learning.
- **Interdisciplinary Research Centre: The Centre for Inter-disciplinary Studies of Mountain and Environment (CISHME)** has researchers drawn from disciplines like Ecology, Biodiversity Conservation & Management, Aquatic Ecology and, Remote Sensing and Geographic Information System (GIS) working together with various projects.
- **Interdisciplinary M.Phil. Programme:** The South Campus of the University of Delhi conducts an interdisciplinary **M.Phil. Programme in Biotechnology**. The course work and research are jointly taken care of by all the applied science-based departments in South Campus namely Biochemistry, Biophysics, Genetics, Microbiology and Plant Molecular Biology.

In 2012, the departments of Economics, English, History, Political Science and Sociology, participated in an interdisciplinary M.Phil. Course on “Caste in the Disciplines” as a part of a series of courses on methods and approaches in the Social Sciences.

- **Interdisciplinary Research Journals:** The University publishes two peer-reviewed online interdisciplinary journals- *The Delhi University Journal of the Humanities and the Social Sciences & the Delhi University Journal of Undergraduate Research and Innovation*. Both the journals have strong interdisciplinary flavour and encourage reporting of original research by department faculty, college teachers, research scholars and students.
- **Interdisciplinary Conferences:** The University encourages its departments to hold conferences in interdisciplinary areas. Several departments (on a collaborative basis), like Mathematics and Operational Research; Physics and Economics; and Sociology, Geography and Economics have held such conferences.

- **Interdisciplinary Lectures:** Several departments of the University organize popular lectures and talks by subject experts from time to time. Similarly, the Alumni Lecture Series of the University - Percipience, and Ambassadorial Lecture Series are also organized.

### **3.7 Mechanisms adopted by the University to facilitate the smooth implementation of Research Schemes/ Projects**

The **Research Council in the University** ensures smooth implementation of research programmes. Through the following mechanisms of continuous assessment, it constantly **reviews the research programmes and undertakes timely measures for addressing any** issues related to the ongoing research at the University:

- **Sponsored Research Project Guidelines:** The University facilitates the acquisition of grants from extramural sources by providing mechanism for submitting research proposals, and their implementation after sanction, through well-defined guidelines for Sponsored Research Projects. These guidelines help in operationalization of all aspects of the research project activity, such as release of grant, appointment of staff, purchase of equipment, periodic budget review and final submission of utilization certificate. **Please see Annexure III for details.**
- **Standardized Operating Procedures** have been developed for the implementation of all schemes related to research.
- **Dedicated Finance Branches for Major and Minor Research Projects:** The University has allocated distinct finance branches and dedicated staff for handling major research projects, minor research projects, university grants and other aspects related to research projects.
- **Appointment and Purchase Committees:** Detailed procedures for purchase and appointments in projects have been put in place for uniform application under the varied extramural and university grants. Well defined Project Appointment Committees and Project Purchase Committees are constituted to take the requisite operations forward.

### 3.8 Ethical Guidelines in Research followed in the University

Scientific research involves the cooperation and coordination of different people to achieve goals that have impact on society and are essential for overall development in all areas. Research requires experimentation, data analysis, writing research papers and grant proposals and educating future scientists. Thus, it is essential that research is carried out in ways that are ethically correct. Guidelines for research ethics are laid in such a way that concerns of research institutions and individuals are simultaneously addressed. Also, it is important to adhere to these ethical guidelines in order to preserve the dignity, rights and welfare of researchers and research participants. Based on area of research and subjects involved, guidelines for carrying research has been defined by various agencies. These guidelines can be found on WEBSITE of various government agencies. All the researchers at University of Delhi are expected to follow the Ethics of research as described in the guidelines.

Research Council ensures that the ethics guidelines mandated by the funding agencies are followed. Some of the guidelines are given below:

- **Biomedical Research on Human Participants:** The Nuremberg Code formulated in 1947, was the first international statement on ethics of medical research using human subjects. Over the years, various international and national advisory bodies have revised and laid down principles for scientific research involving human beings. Clinical research is required for better understanding of science and developing drugs, vaccines, diagnostics, instruments and materials which can enhance quality of human health. However, it is important to give credit to individuals who volunteer to participate in biomedical research. To protect the interest of participants in biomedical research, ethical guidelines are established. In India, the Indian Council of Medical Research (ICMR), Govt. of India, sets ethical guidelines for biomedical research involving human participants. Research on human subjects follows the principles of essentiality of the research, voluntariness, informed consent, non-exploitation, confidentiality, accountability and transparency. The guidelines can be found at: [icmr.nic.in/ethical\\_guidelines.pdf](http://icmr.nic.in/ethical_guidelines.pdf)
- **Working with Laboratory Animals:** In India, the Committee for the Purpose of Control and Supervision on Experiments on Animals (CPCSEA), has laid down guidelines to assure quality maintenance and humane care of laboratory animals while conducting

scientific experiments. These guidelines also set rules for proper procurement, quarantine and rearing of laboratory animals. Every department of University of Delhi which has animal house and involve animals in research should have committee which examine and approve all the proposals of research involving animals. The guidelines can be found at: [cpcsea.nic.in/Content/55\\_1\\_GUIDELINES.aspx](http://cpcsea.nic.in/Content/55_1_GUIDELINES.aspx) and [www.cpcsea.com](http://www.cpcsea.com)

- **Working with Chemicals:** The Bureau of Indian Standards, Govt. of India, recommends a code of safety for all chemical laboratories in India. It involves guidelines for recognizing potential chemical hazards and employing corrective actions in order to expeditiously minimize accidents. Every researcher at University of Delhi is expected to follow the guidelines especially with the hazardous chemicals. Details can be found at: [images10.newegg.com/UploadFilesForNewegg/.../is.4209.19871453376681588.pd](http://images10.newegg.com/UploadFilesForNewegg/.../is.4209.19871453376681588.pd)
- **Radiation Safety:** These guidelines set by the Department of Atomic Energy, Govt. of India, apply to practices adopted and interventions applied while working with radiation sources in Indian laboratories. They ensure that the ionizing radiation and nuclear energy does not cause any risk to the health of researcher and the environment. Close monitoring by institutional radiation safety committee helps in ensuring compliance to these guidelines so that the exposure to all sources of ionizing radiation should be ‘as low as reasonably achievable’. <https://www.aerb.gov.in/index.php/.../radiation.../application-in.../nuclear-medicine>
- **Recombinant DNA Technology and Bio-contaminants:** Recombinant DNA technology is the most popular method of introducing gene or related material in microorganism, plants and animals. Department of Biotechnology has given guidelines for research work in this area. The details can be found at: [www.dbtindia.nic.in/.../Draft-Biosafety-Regulations-and-Biocontainment-Guidelines-2017](http://www.dbtindia.nic.in/.../Draft-Biosafety-Regulations-and-Biocontainment-Guidelines-2017).

### 3.9 Consultancy

The University has a structured consultancy policy\* and a centralized mechanism to regulate consultancy offers in the capacity of both individual and the organization. A faculty member can spend maximum 40 days in a year for consultancy. All remunerations related to consultancy are

received in favour of the Registrar of the University. A faculty/ group receives 75% of total consultancy and 25% of the amount is remitted to University Development Fund. Remuneration paid to an individual faculty in one academic year should not exceed his/her total salary for the year. It is also ensured that the consultancy work at no stage interferes with the normal teaching/research work of any faculty. The administrative charges and charges for the use of equipment/instruments are decided by University as a percentage of the total consultancy amount involved. However, for individual consultancy where lab facility is not needed, no charge is levied.

### 3.9.1 \* *Guidelines followed for consultancy work by the academic staff of the central Universities*

#### **Guidelines for Professional Consultancy**

Preamble: In order to ensure effective teaching in the technological Institutions, there is a need for interaction with the industry and other Institutions of higher learning in the form of:

- Industrial Consultancy
- Sponsored Research
- Transfer of know how in the shape of patent etc.
- Inter-Institutional collaboration in selected research areas of mutual interest.

#### **Consultancy services may be categorized as under**

- Individual Consultancy
- Consultancy that does not involve the use of any Institutional facilities.
- Institutional/Departmental Consultancy
- It involves the use of University facilities such as equipment, instrument, computer, Laboratory Staff and administrative persons etc.

#### **Organizational Set-Up**

The Research Council shall constitute a committee including subject expert(s) from the University.

#### **Payment for consultancy and permissible limits**

- All consultancy assignment by faculty members should be undertaken with prior concurrence of head of the department and permission of dean consultancy.
- A faculty member may be allowed to spend normally a maximum of 40 days a year for consultancy. In special cases Vice-Chancellor's permission may be sought.

- Examination, Lectures, Selection Committees and other professional work of faculty are not to be included in the consultancy.
- All remuneration for consultancy should be received by a cheque/draft in favor of Registrar of the University, Individual Faculty Members should not receive any cash directly.
- A Faculty Member of a Group will receive 75% of total consultancy fees (item vii (F.) of para II) paid by the client and the balance of the 25% of such amount shall be remitted to the University development fund.
- Remuneration paid to an individual faculty member for consultancy as his share in one academic year should not exceed his total salary for the year. Any amount in excess of this prescribed limit due to a faculty member will be remitted to the University development fund.
- Quarterly statements of consultancy services rendered by each faculty shall be forwarded by the Dean, consultancy for information and record of the Vice-Chancellor. This statement will also show the total of fees received by individuals up to date in the academic year.

### **3.9.2 Revenue generated by the faculty members by consultancy (2012-2017): Rs.105.61 Lakhs**

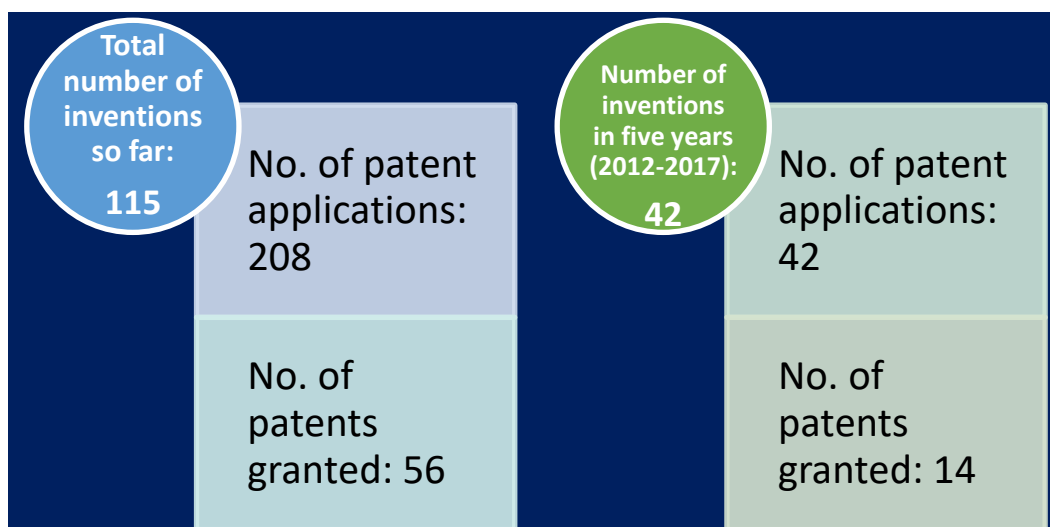
Consultant(Name of Faculty)	Faculty/ Department	Consultancy project	Consulting/ Sponsoring agency	Revenue generated (in Rs.)	Year
Prof. Anil Grover	Department of Plant Molecular Biology	Visiting Professor Programme	King Saud University(KSU) Riyadh, Arabia	3,24,260	2013-2014
				3,36,812	2014-2015
				8,39,398	2015-2016
				3,50,362	2016-2017
				7,07,782	2016-2017
Dr. Hamandra Dangi	Department of Commerce	Disaster Management	Guru Gobind Singh Indraprastha University	75,850	2016-2017
		Teri University	Teri University	72,000	2016-2017
Dr. Kamala Sankaran	Faculty of Law	Legal Empowerment of the Working poor	Women in informed Employment: Globalizing & Organizing (WIEGO)	5,24,039	2012-2013
Prof. M.K. Pandit	Department of Environmental Studies	Biodiversity studies in Sikkim, Arunachal	RS Environlink Technologies Pvt. Ltd.	20,00,000	2014-2015
				11,80,000	2015-2016

		Pradesh & Shutkari & Papu		12,00,000	2016-2017
Dr. N. C. Pant	Department of Geology	National Hydro-Electric Power Corporation	National Hydro-Electric Power Corporation	18,000	2012-2013
Dr. Pamela Singla	Department of Social Work	Soft Skill Training	J & K Police	6,00,000	2013-2014
				2,03,587	2014-2015
Dr. Partha Pratim Chakraborty	Department of Geology	Petro physical Characterization of Carbonate reserves from Middle East	Schlumberger Asia Service Ltd.	2,25,000	2012-2013
Dr. Satyajit Singh	Department of Political Science	Study Trip (consultancy) UNDP Myanmar	Govt. of Myanmar	98,175	2014-2015
Dr. Shashank Shekhar	Department of Geology	A Novel project for sustainable drinking water supply from Palla reach - Yamuna flood plain	Water and Power Consultancy Services (India) Ltd.	3,50,000	2012-2013
				3,00,000	2014-2015
Dr. Tanuja Agarwal	Faculty of Management Studies (FMS)	Conducting Organization Wide Climate study	GAIL (India) Ltd.	2,00,000	2013-2014
				1,60,000	2015-2016
Prof. Vijay K Chaudhary	Department of Biochemistry	Transfer of Technology of TB confirm Test	Yash Raj Biotechnology, Navi Mumbai	5,00,000	2015-2016
Dr. Vikrant Jain	Department of Geology	Min. of Water Resources	Formal Methods for Industrial Critical Systems	2,98,252	2013-2014

### 3.10 IPR Cell and Patent Fund

The University has an Intellectual Property Rights Cell and a Patent Fund to support the intellectual property filing needs and awareness generation in the area. The University also had an IPR Chair instituted by MHRD that was functioning at the University for the past few years and has held various training programmes and conferences to promote the research culture. So far, a total of 115 inventions have been made by the University out of which 208 patents were filed in various countries and 56 applications have been granted (**Annexure IV**).

In the last five years (2012-2017), 42 inventions have been made, out of which 50 patents were filed in various countries and 14 applications have been granted (**Annexure V**).



**42 inventions: 50 patents filed in various countries and 14 applications have been granted (2012-2017)**

**Patents Granted**

<ul style="list-style-type: none"> <li>• Curcumin Analogs And Methods Of Making And Using Thereof</li> <li>• Aminoquinoline Derivatives And Uses Thereof</li> <li>• A Method Of Virus-Induced Gene Silencing In Rice Using A Vector Derived From A Dna Virus</li> <li>• Withania Somenifera Plant Extract And A Method Of Preparation Thereof</li> </ul>	<ul style="list-style-type: none"> <li>• Method Of Producing Alkalo thermostable Xylanase From Bacillus Pumiius Strain Mk001 By Solid State Fermentation</li> <li>• A Process For Extraction Of Bioactive Psoralen Compound</li> <li>• Pcr-Based Detection Method For Chlamydia Trachomatis</li> <li>• A Process For Producing Modified Reconstituted Sendai Viral Envelope Specific For Drug And Or Gene Delivery To Liver Cells</li> </ul>	<ul style="list-style-type: none"> <li>• Improved Process For Expression, Purification And Enhanced Recovery Of Mycobacterial Recombinant Proteins</li> <li>• A Novel Cytoplasmic Male Sterility System For Brassica Species And Its Use For Hybrid Seed Production In Indian Oilseed Mustard Brassica Juncea.</li> <li>• Mutants Of Mycobacteria And Process Thereof</li> <li>• Novel Gene Osisap1 Of Rice Confers Tolerance To Stresses And A Method Thereof</li> <li>• Regulation Of Lethal Gene Expression In Plants</li> </ul>
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**Patent Applications Filed**

<ul style="list-style-type: none"> <li>• A Device For Measuring Trigonometric Functions</li> <li>• Novel Brominated Phenothiazine Scaffolds And Methods Thereof</li> <li>• A Herbal Compound From Clycine Max Seeds For Controlling Diabetes And Dyslipidemia</li> <li>• A Method And Apparatus For Identification of Heterosis In</li> </ul>	<ul style="list-style-type: none"> <li>• A Molecular Beacon-Mediated Oligonucleotide-Based Diagnostic probe/Tool/Kit For Detection of Trichomonasvaginalis And Method Of Working For Same</li> <li>• Production of Rifamycin B Analog 24-Desmethylrifamycin B By Swapping Acyl Transferase Of Module 6 (Propionate Specific ) Domain Of Rifamycin Polyketide</li> </ul>	<ul style="list-style-type: none"> <li>• Thionated Cinnamates And Process For Preparation Thereof Nirmal Seeds, Pachora, Maharashtra</li> <li>• Polynucleotides Encoding Heat Shock Transcription Factor And Uses Thereof</li> <li>• N-Protected Isatin Compounds</li> <li>• Abiotic and Heavy Metal Stress-Inducible Nbs-Str1 Promoter From Rice.</li> <li>• Tissue Specific Promoter And Uses</li> </ul>
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<p>Indica Rice Hybrid</p> <ul style="list-style-type: none"> <li>• Semantic Integration And Cataloguing Of Biological Experimental</li> <li>• A Method Of Transient Expression Of Gene Of Interest In Plants Using A Plant Dna Virus Based Vector</li> <li>• Method For Bio-Bleaching Of Wood Kraft Pulps</li> <li>• A Process Of Producing Orf-Enriched Phage Display Library And Uses Thereof</li> <li>• A Novel Beacon-Based Diagnostic Probe/Tool/Kit For Detection Of Translocation 8;21 In Acute Myeloid Leukemia Patients And Method Of Working For The Same</li> <li>• A New Fluorescent Beacon Probe Diagnostic Tool/Kit For Molecular Detection Of Translocation T(9;22)/Bcr-Abl1 In Leukemic Patients And Method Of Working For The Same</li> </ul>	<p>Synthase (Pks) Gene Cluster Of Amycotatopsis Mediterranei S699 With That Acyl Transferase Of Module 2</p> <ul style="list-style-type: none"> <li>• A Composition For Developing Latent Impression Marks And Process For Preparing The Same Institute of Plasma Research, Ahmedabad</li> <li>• Nutritional Compositions And Methods For Manufacturing The Same</li> <li>• Solar Water Distiller</li> <li>• Coating Compositions And Methods From Preparation Thereof</li> <li>• A Novel Oligonucleotide - Based Diagnostic Probe/Tool/Kit For Tuberculosis Detection And Method Of Working For Same</li> <li>• A Bio-Conversion Method To Improve Nutritional Properties Of Lignocellulosic Residues</li> </ul>	<p>Thereof</p> <ul style="list-style-type: none"> <li>• Coumarin Compounds For The Treatment Of Mycobacterial Infections</li> <li>• Spiro-(Indoline-Isoxazolidines) Compounds Having Inhibitory Effects on Cytokine-Induced Cell Adhesion Molecule Icam-1 Expression onto Human Endothelial Cells.</li> <li>• Optimized Process For Production Of Alkaline Lipase Enzyme From Pseudomonas Sp. And Its Applications Thereof</li> <li>• A Synergistic Herbal Composition For Prevention And Treatment Of Diabetic Retinopathy And Cataract</li> <li>• A Process For Producing Aromatic Carboxylic Acids By Oxidation Of Methyl Arenes</li> </ul>
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### 3.11 Technology Transfer

One of the major aim of research in Science is to develop processes, devices, molecules and materials as applications which can be useful for the society. The knowledge of developed processes or devices or material for wider distribution is transferred to another group or company or industry for commercialization as it requires mass application or production. The technology transfer along with patenting helps in protecting interest of person or group of people who develop the technology. Many Government organizations and Industries have developed guidelines for transfer of technology. These guidelines vary based on their aim and financial input in the organization.

The Patent Cell of the University of Delhi helps in writing and filing the patents. The technology transfer at present can be done with the help of proposal specific committee which can be constituted by patent/ technology transfer cell or Research Council in consultation with Principal Investigator.

### Some of the examples of Technology/Research transferred to industry

Name of the Faculty	Centre/ Department	Description of the technology	Applications	Technology transferred to
Prof. Daman Saluja	Dr. B.R. Ambedkar Centre for Biomedical Research	<i>Chlamydia/Neisseria</i> Detection Kit	Rapid, cost effective diagnosis infection caused by <i>Chlamydia/Neisseria</i>	DSS Image tech Pvt. Ltd.
Prof. Vijay K Chaudhary	Biochemistry	TB confirmation Test	For diagnosis of Tuberculosis (TB)	Yash Raj Biotechnology, Navi Mumbai
Prof. Vinay Gupta	Physics	Development of table-top Surface Plasmon Resonance (SPR) set up		Industry Optiregion, Delhi

#### 3.12 Memorandum of Understanding (MoU)

The University has been actively collaborating with many academic and research institutions to widen its research base and to share and infuse new themes of study and research in different disciplines and subject areas. In the last five years, the University has signed about 87 Memorandums of Understanding (MoUs) with various National & International Universities, Industries and Corporate houses. The list of MoUs is presented in **Annexure VI**.

**Total number of MoUs (2012-2017): 87**

#### 3.13 Linkages with Other Institutions

In its constant endeavour to achieve excellence in research and innovation by exploring novel research paradigm, the University incentivize research by strengthening linkages and expanding National and International collaborations and partnerships with key academic institutions, industry, government, policy makers and sponsors of research. A large number of linkages have been made in the last five years for exchange of faculty and students, for internships, dissertations and research projects. The list of linkages made with national and international collaborators can be found in the **Annexure VII, VIII and Annexure IX**.

### **3.14 University of Delhi as a member of Educational network and Global Initiative of Academic Network (GIAN)**

In order to add value to the learning environment, the University facilitates visit of eminent scientists/professors to the campus as adjunct professors. It regularly invites distinguished faculty from different fields to participate in its programmes as Visiting Professors, Scholars of Eminence and Adjunct Professors. The University of Delhi is a part of the following educational networks:

- Association of Commonwealth Universities (ACU)
- International Association of Universities (IAU)
- International Association of University Presidents (IAUP)
- Asia Pacific Association for International Education (APAIE)
- Association of Indian Universities (AIU)
- Commonwealth Universities Study Abroad Consortium (CUSAC)
- Association of University of Asia and the Pacific (AUAP)
- Global Problem Solving Consortium (GPS)
- Universitas 21 (U21)
- World Cities World Class Universities (WC2)

The University is also part of the Global Initiative of Academic Networks (GIAN) in Higher Education, an initiative of the MHRD, GOI to increase the presence of reputed international faculty in the Indian academic institutes.

### **3.15 Research Journals of the University**

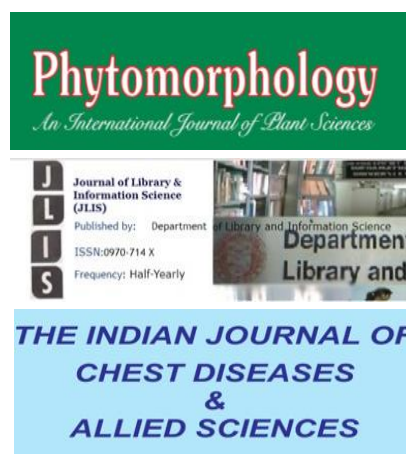
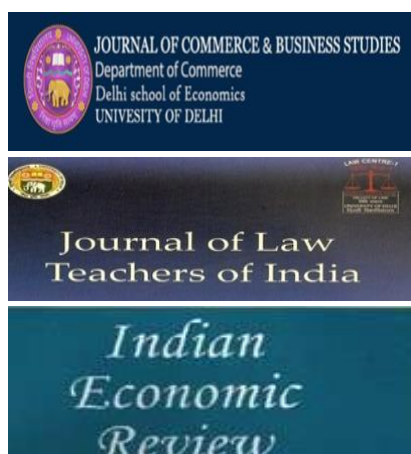
The University of Delhi publishes two e-journals:

1. The Delhi University Journal of the Undergraduate Research and Innovation (ISSN 2395-2334), an online bi-annual peer reviewed research journal (first of its kind in India).<http://journals.du.ac.in/ugresearch/index.html>
2. The Delhi University Journal of the Humanities and the Social Sciences (ISSN 2348-4357), peer- reviewed research journal.<http://journals.du.ac.in/humsoc/index.html>



In addition, there are several other journals which are published by departments and colleges. These are:

- Indian Economic Review (Department of Economics) ISSN: 0019-4670 (print version), ISSN: 2520-1778 (electronic version). <https://www.springer.com/economics/journal/41775>
- Journal of Commerce & Business (Department of Commerce) ISSN: 2322-0767, <http://www.journal.commerce.du.ac.in/>
- *Vageeshwari* (Department of Music) ISSN: 0975-7872
- Indian Law Journal
- Indian Journal of African Studies (Department of African studies). <http://as.du.ac.in/publications.html>
- Journal of Law Teachers of India (Faculty of Law), ISSN: 2231-1580. <http://law.du.ac.in/research--journal.html>
- The Indian Journal of Chest Diseases & Allied Sciences (VPCI), ISSN: 0377-9343. <http://www.vpci.org.in/journal.php>
- Yearly Review (Department of English)
- Journal of Library & Information Science (Library and Information), ISSN: 0970-714 X, <http://dlis.du.ac.in/JLIS.htm>
- Phytomorphology (Department of Botany) ISSN: 0031-9449, <http://ispm.co.in/phytomorphology.html>



### 3.16 Innovation Centres in the University

#### Cluster Innovation Centre

The Cluster Innovation Centre or CIC as it is popularly known- was established in 2011. It has been designed to seek and derive innovations from various clusters such as industries,

villages, slums and educational clusters. It is an endeavour to harness the passion and dedication of bright young minds to solve some of the major challenges of our civil society through its learning and research programmes.

The CIC has pioneered the concept of **Meta College** as well as **Meta University** and runs a highly innovative state of the art learning and research programmes. The Design Innovation Centre (DIC) at CIC, established in 2015 under the National Initiative for Design Innovation with funding from MHRD offers graduate and post-graduate Programmes and student internships that are mentored by junior and senior design fellows.

DUCIC offers electives, certificates courses, workshops and design camps with the objectives of infusing design-based learning. The courses are delivered in blended-learning format. Currently, at DUCIC-Technology Business Incubator (MSME), eight projects are being incubated. The DUCIC Technology Business Incubator provides funding (through MoMSME), mentoring and co-working space to students facilitate start-ups. So far, three profitable companies have graduated.

### **Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)**

CIDRET was established under Ordinance XV-A of the University in October 2015 with the main objective to develop innovative approaches towards **developing diagnostics, prophylactics and therapeutics for infectious diseases plaguing India, such as Tuberculosis, Malaria, Typhoid, HIV-AIDS, Chikungunya and Dengue infections.** Another objective is to make its state-of-the-art Genomic and Proteomic facilities available for use by the scientific community, and to train students, research scholars and teachers in advance techniques and technologies, beyond their regular classroom learning, through short-term and long-term courses. Yet another aim of the centre is to interact with the Biotech Industries to provide consultancy and solutions through the expertise and facilities available to scientists involved at CIIDRET. CIIDRET also promotes **Industry-Academia Interaction through ‘Entrepreneurship Guest Public Lecture Series’**, which includes lectures by Entrepreneurs and the facilitators of Innovation.

### **3.17 Entrepreneurial Projects/Activities in the University**

#### **Incubation Centres in the University**

## ***Electropreneur Park***



A first of its kind Electropreneur Park to support start-ups in electronic system design and manufacturing (ESDM) has been established at the South Campus of the University, under the aegis of the Ministry of Electronics and Information Technology, Software Technology Park of India (STPI) and India Electronics and Semiconductor Association (IESA). The main objectives of the Park include:

- Creation of holistic eco-system for encouraging R&D and innovation,
- Entrepreneurship in the ESDM sector in India, enabling the creation of Intellectual Property.
- Provide assistance during prototyping, development and commercialization of the products produced through the scheme for India and other grow the markets,
- Creation of employment at various levels and creation of long- term partnership with strategic sectors.

The major achievements of the start-ups at the Electropreneur Park include the initiation of 4 funded start-ups and launching of 7 products.

### **Various start-ups (incubation & pre-incubation) at Electropreneur Park are as follows:**

- Starbru Techsystems Pvt. Ltd.
- Stemrobo Technologies Pvt. Ltd.
- Fitnano Technologies Pvt. Ltd.
- Univlabs Technologies Pvt. Ltd.
- Doorastha Analytics Pvt. Ltd.
- EVI Technologies Pvt. Ltd.
- AJ Simply Purify Technologies Pvt. Ltd.
- IOTomation Ecotech Pvt. Ltd.,
- Ceantra Technologies Pvt. Ltd.,
- Resonant Electronics Pvt. Ltd.,
- GlenElek,VTLab

## Technology Business Incubator

The Ministry of Micro, Small Medium Enterprise (MoMSME) has supported the Technology Business Incubator (TBI) at the Cluster Innovation Centre, University of Delhi (DUCIC, TBI) under the scheme "Support for Entrepreneurial and Managerial Development of SMEs through Incubators". TBI has been set up with an objective to facilitate nurturing of ideas by promoting emerging technological and knowledge based innovative ventures.

### The following are the ideas approved by MoMSME:

- Mathematical Games
- Ed Rob
- Sign My Tour
- Pix Vera
- Ideas Market
- Survaider
- Apparel Media
- Tnine Infotech
- Lithic

#### Facilities for converting ideas to products



#### Innovative Products Developed



SmartX    Arete    Awaas    Food Passport    Sens On Takhti    Nest    VaccSure    Gloop    DALI    Home office    DIY clocks    Accieo

### 3.18 Research Facility/Infrastructure in the University

Besides the well-equipped laboratories with state-of the art facilities across the departments, the University has “Central Instrumentation Facility” (CIFs) at the North campus (<http://www.du.ac.in/du/index.php?page=university-science-instrumentation-centre>) and South campus (<http://cifsouthcampus.org>). CIFs have a team of trained professional who help the faculty/scholars to process/analyze their samples using the high-end equipment such as

Mass Spectrometer, DNA Sequencer, Transmission Electron Microscope (TEM), Confocal Microscope, Nuclear Magnetic Resonance (NMR), CD-Spectrometer, FTIR spectrometer with ATR & Specular reflectance, LCMS with Quadropole time of flight etc.



### 3.19 Major Areas of Research in the Departments

Following is a brief description of the major areas of research undertaken in various departments:

**Adult Continuing Education and Extension:** Extension education and services in higher education, Curriculum Development and Environmental Issues, Research Methodology, Adult, Continuing Education and Extension, Lifelong Learning (LLL), Non-Formal Education, Skill Development

**African Studies:** Social Theories, Sociology of religion, African environment, natural resource management, disaster management, Ancient African Empires, Pan-Africanism, and African nationalism, Multi-Party Democracy in Africa, Human Rights & Refugee Problems, Africa in World Politics, India's foreign policy in Africa, Food Security and agriculture development, SAP & its impact on Africa, Regional Economic Groupings and India-Africa Economic Relations.

**Anthropology:** Comparative religion, caste system, family dynamics, medical systems, and anthropological theory and methods, Gender and Women's Studies, Caste studies with special interest in Dalit studies, Ecology and Environment and Border and Margins of Society, Human Genetics, Human Cytogenetics, Recombinant DNA Technology, Reproductive Immunology, Medical Anthropology; Qualitative Research; Public Health; Disaster Impact Assessment Tools; Anthropology and Mountain Communities, Genetic Structure, Diversity and Health Dynamics Among Human Coastal Populations, Association of variants of uncoupling protein 1(UCP 1) with levels of obesity, cardiovascular and metabolic complications among adolescent and adult in two homogenous groups, Human Ecology, Human Growth & Development, Physiological Anthropology, Applied Anthropology, Tribal health.

**Arabic:** Modern Arabic Literature, Islamic studies and Translation, Classical Arabic Literature, Indo- Arab Literature, Arab Civilization and Islamic Studies.



**Biochemistry:** Recombinant antibodies for therapeutics and diagnostics, Drug design and discovery against cardiovascular diseases, Haemoglobin and artificial blood substitutes, Molecular oncology and anti-cancer therapeutics, Microbial genomics and Immunodiagnosics, Bioinformatics, Network. Biology and Immuno informatics, Signal Transduction Mechanisms of *Mycobacterium tuberculosis*.

**Biophysics** Membrane Biophysics, Ion Channels, Neuro-biophysics, Cognitive Science (Learning & Memory), Theoretical & Mathematical Biology, Structural Biology, Computational Biology and Bioinformatics, Computational Biology, Bioinformatics, Next Generation Sequencing, Protein and Genome Sequence Analysis, Use of Machine Learning Methods in Biology

**Botany:** Developmental and Reproductive Biology, Functional Genomics, Proteomics and Genetics, Physiology and Biochemistry, Plant Biotechnology, Systematics and Ecology, Plant- Microbe/Plant-Pest interaction, Biodiversity Conservation and Evolutionary Biology, Climate change and Abiotic Stress.

**Buddhist Studies:** Buddhist History, Buddhist Archaeology, Buddhist Art & Architecture, Theravada Abhidhamma Philosophy, Theravada Buddhist Psychology, Theravada Buddhist Para- Psychology, Theravada Buddhist Eschatology, and Pali (Language and Literature), Buddhist Philosophy, Theravada, Mahayana, Logic & Tantra.

**Chemistry:** Bio-organic chemistry, synthetic organic chemistry, natural products and non-covalent interactions in chemistry & biological fields and supramolecular chemistry, Theoretical polymer chemistry with special reference to electrically conducting polymers and biopolymers such as proteins and DNA, Nanomaterials and conducting polymer composites for fabrication of biosensors, Clay polymer nano composites as fire retardants and for synthesis of organic compounds, Physical Chemistry, Quantum Chemistry, Spectroscopy, Computational Chemistry, Nanoscience, Theoretical Physical Chemistry, Complex Systems in Electrochemistry and Materials, Synthesis of novel heterocyclic compounds; Sonochemistry, Application of microwaves in organic synthesis; Synthesis, characterization and applications of ionic liquids in organic synthesis; Preparation, characterization and applications of metal nanoparticles in organic synthesis; Synthesis of heterocycles by multi-component reactions, photophysical studies, Corrosion Science and Technology, Semiconducting nano materials for environment, Organic Synthesis, Medicinal Chemistry (synthesis of biologically active compounds: anti-cancer, antiviral, antibacterial, antifungal, and antimalarial), Natural and Marine Natural Products (bioactivity guided isolation of natural/marine natural products). Process development of drugs/drug intermediates.

**Commerce:** Marketing; Organisational Behaviour and Development; Finance; Accounting; International Business; Taxation.

**Computer Science:** Computer Networks, Data Mining, Computational Intelligence, Algorithms, Web Intelligence, Multi-agent systems, Software Engineering, Steganography and Steganalysis, Information Hiding, Coding Theory, Intelligent Data Analysis.

**Dr. B.R. Ambedkar Centre for Biomedical Research:** Functional Genomics of *Mycobacterium tuberculosis*, Epigenetics and Developmental Biology, Molecular Biology of Cancer, Molecular Virology & Human Genetics, Molecular diagnostics and basis of pathogenesis by *Neisseria gonorrhoeae* and *Chlamydia trachomatis*, Regulation of gene expression.

**East Asian Studies:** China's foreign policy, security policy, and political economy, Chinese Politics and Education, Ancient Indian History, Silk Road and Buddhist settlements, Chinese language, Socially engaged Buddhism, Chinese Nationalism, Chinese Ethnic Minorities, Chinese Foreign Policy, Tibet, Taiwan, Xinjiang, Hong Kong, India-China Relations, Sociology, East Asian Society, Japanese Society and Religions, Japan's Social, political, intellectual And Cultural History, Japanese Language and Literature; Japanese society and Gender Studies, Dynamics of Social Stratification in China.

**Economics:** International Trade, Industrial Economics, Game Theory, Econometrics, Law & Economics, Information Economics, Applied Econometrics, Applied Micro, Growth and Development, Macroeconomics, International Economics, Economics of discrimination, Aspects of the Chinese economy, Forecasting, Microeconomic Theory, Welfare Economics, Development Economics, Agricultural Economics, Health Economics, Public Economics, IPRs and Technology Transfer.

**Education:** Asian Education and South Asia related education, women education; Childhood, Children's Identities and Schooling; City, Migrant Social groups and Education; Class, Caste, Gender and Urban Education; Cognitive Psychology; Comparative & International Education; Computer Assisted Learning; Contemporary Education in India, under diversity, gender, caste, policy; Developmental Psychology; Disability Studies; Education of Gifted Students; Education, State, Market and Society; Educational Planning and Policies, Social-Historical Perspectives; Educational Policy, Planning and Administration; Educational Psychology; Elementary Education; English Language Teaching; Ethnography of Schools; Gender Issues in Education; Gender Studies; Gender, School and Society; History Education; History Education; ICT in Education; Identity & Education; Impact of Social Factors such as poverty, class, language, gender etc on Education; Inclusive Education; Inclusive Education and Educational Technology; Inclusive Education of Children with Disability; Indian Psychology & Philosophy; Integral Education and Psychology; Language Education; Marginal Identities and Schooling; Mathematics Education; Mental Health; Pedagogy of Sanskrit; Pedagogy of Science; Philosophy of Education; Science and Environment Education; Science Education; Social. Science Education; Social Theory of Education; Teacher Education; Technology in Mathematics Teaching and Learning; Youth, Democracy and Education

**Electronic Science:** Microwave, Optical Electronics, Artificial Intelligence, Nanoelectronics/Material Science/ Semiconductor Devices, Biomedical Instrumentation, Microelectronics/VLSI/ Embedded System, Semiconductor Material Thin Films/Photovoltaics, Optical Devices, Spintronics, Signal Processing

**English:** Renaissance studies, gender studies, visual culture, Modernism, Queer Theory, Dalit Literature, Autobiographical Studies, Indian Literature, Post-colonial Studies, Translation, Postcolonial Literature and Theory; Literary Gerontology; Families in Literature; Urban Cultures; the nineteenth-century novel.

**Environmental Studies:** Environmental Biotechnology & Bioremediation, Nano-bioscience, Ecogenomics, Himalayan Ecology, Conservation Biodiversity & EIA studies, Allelopathy, Invasion Ecology & Soil Communities, Behavioural Ecology, Foraging and nesting ecology, Evolution, Biodiversity conservation, Urban Ecology, Fish biology & Herpetology, Systematics, Biodiversity Conservation, Molecular phylogeny & Evolution, Soil Microbial Ecology; Bio-/Phyto- Remediation; Plant-Microbe Associations; Bioresources & their Utilization, Ecology and Conservation, AMF studies Diversity of symbiotic micro-organisms, Legal regimes and policy frameworks in conservation programmes, Ecotoxicology, Environmental Pollution & Health, Bioprospecting, Protein Biochemistry, Environmental Biotechnology, Plant invasions, phenotypic plasticity in plants, Ecosystem studies and function in invaded systems, evolutionary perspectives in plant invasions, Plant Diversity, Bioacoustics, Behavioural and community ecology of Invertebrates, Tropical forests and biodiversity conservation.

**Faculty of Management Studies:** Growth & Behaviour Patterns of Companies in India, Marketing, Financial, Human Resource and Organizational Dimensions of Modern Industry & Business.

**Financial Studies:** Quantitative Finance; Investment Management and Fuzzy Decision Making, Strategic Management of Information Systems, e-commerce, Bank Management, Corporate finance; strategic finance; capital markets; venture capital, Corporate Reporting, Corporate Governance— Transparency and Disclosure Issues.

**Genetics:** The department is engaged in Interdisciplinary research in the frontline areas of Plant Genetics, Molecular Breeding and Biotechnology like genetic improvement of oilseed mustard through conventional and biotechnological approaches; novel strategies (based on RNAi and artificial micro RNA) for the control of viral and fungal pathogens and insect pests in crops; Human Genetics & Medical Genomics with focus on discovery and functional genomics of common as well as emerging complex diseases and discovery of lead molecules; Drosophila Genetics for basic research and as model for disease biology; Plant-pathogen interaction using Arabidopsis as a model and mustard as a target crop ; Dictyostelium biology to elucidate the role of bZIP transcription factors, Parvulin type PPIases, PinA and other protein regulators; Yeast Genetics with a focus on mitochondrial ribosome

function/biogenesis; Cancer Genetics to understand molecular and cellular changes occurring in hypoxic tumor microenvironment; Promoter architecture and gene regulation in plants.

**Geography:** Quantitative Techniques, Urban and Regional Studies, Programme Evaluation, Indian Geography, Disasters and their Management in India, Political Geography, Regional Geography of Middle East, Geography of Federal Study, Spatial Studies, Watershed Management; Mountain Hydrology; Ecotourism and Conservation, Environmental Studies, Remote Sensing and GIS, Disaster Management, Climate Change, Urban Environment.

**Geology:** Igneous & Metamorphic Petrology, Geochemistry, Structural Geology, Igneous Petrology, Geochemistry, Vertebrate Palaeontology, Geochemistry and Geochronology, Metamorphic Petrology, Environmental Geology, Hydrogeology, Biostratigraphy, Engineering Geology, Structural Geology, Sedimentary Geology, Mineralogy, Petrology, Geomorphology, Fluvial system, Sedimentary Geology and Geomorphology, Hydrogeology, Geomorphology, Sedimentology, Micropaleontology, Metamorphic Petrology, Stratigraphy, Sedimentology.

**Germanic & Romance Studies:** French and Francophone Literature, German Literature, Latin American and Spanish literature, Italian Literature, Portuguese Literature, Comparative Literature, Postcolonial Studies, Translation Studies, Foreign Language Education with focus on Teaching French/German/Italian/Spanish/Portuguese as a Foreign language.

**Hindi:** Bhakti Literature and Movement and Modern Hindi Literature, Dalit literature, Fiction, Hindi language, Language pedagogy, Media, Indian society & culture, Indian education system, Modern Hindi Literature, Polish English Hindi Translation, Hindi Novel, Poetry, Dalit Literature and Hindi Journalism.

**History:** Social, economic and cultural history, disciplinary history of archaeology, the interface between landscape archaeology and anthropology, medieval state and ecclesiastical institutions, the nationalist movement in India, peasant and tribal societies and movements, the process of sectarian and majoritarian identity formation, memory history-community, oral and performative narratives and their relationships to constructions of particularistic pasts, the interaction between institutions of governance and newer forms of knowledge, with particular reference to the development of humanistic disciplines and of archaeology and museumology.

**Home Science:** Food and Nutrition, Human development and childhood studies, development and communication extension, resource management and design application, fabric and apparel science, Food Technology.

**Institute of informatics & communication:** Internet of Things (IoT), Network Architecture, Network Security, Complex Network, Cryptography, Sensor Network, Service Delivery Design and Architecture, Cloud Computing and Infrastructure, Network Application, Mobile application architecture and security. Modelling and Simulation, Computational neuro-bioscience, Nonlinear dynamics, Applied Numerical analysis, Nonlinear Time Series

Analysis, Stochastic Modelling, Stellar Structure- Evolution, Pulsation, Rotation & Magnetic Fields, Celestial Mechanics and Dynamical Systems

**Library and Information Science:** Marketing of LIS Products , Cataloguing, History of libraries in India and Information Systems, Library, Information and Society, Library Cataloguing, ICT Application in Libraries and Information Activities; Web Designing and Content Development; Library Classification, bibliometrics, Scientometrics and webometrics studies; Government of India Publications, Indian Official Documents, Public Library System, Designing and evaluation of websites, Web- OPACs, e-journals, Social Networking Sites, Syntax, Discourse, Psycholinguistics.

**Linguistics:** Documentation and description of endangered languages, Historical Linguistics, Phonology, Morphology, Language contact, Psycholinguistics and Neurolinguistics, Linguistic Stylistics, Applied Linguistics, Generative Phonology, Translation Studies, Sociolinguistics, Lexicography.

**Mathematics:** Banach Algebras, Complex Analysis, Functional Analysis, Harmonic Analysis, Operator Algebras, Operator Spaces, Dynamical Systems and Ergodic Theory, Operator Theory, Semigroups of Operators, Theory of Frames, Differential Equations on Abstract Spaces, Commutative Algebra, Field Theory and Polynomials, Cryptography and Number Theory, Topology, General Topology, Algebraic Topology, Topological Dynamics, Differential Equations, Fluid Dynamics, Mathematical Modelling, General Relativity, Numerical Analysis, Computational Fluid Dynamics, Analysis of PDE, Partial Differential Equations, Nonlinear Waves, Celestial Mechanics, Nonlinear Dynamical Systems, Simulation and Numerical Modelling, Mathematical Programming, Optimization Theory

**Microbiology:** Microbial differentiation, food and industrial microbiology, environmental microbiology, agricultural microbiology, microbial pathogens and pathogenicity, medical microbiology, immunology, clinical microbiology, genetic engineering and microbial molecular biology.

**Modern Indian Languages and Literary Studies:** Comparative Indian literature, Translations among the Indian Languages, Postmodernism and Post-colonialism in Indian Literature, Women's Writings, Indian Drama and Theatre, Folklore and Tribal Lore of India, Assamese Language and Literature, Bengali Language and Literature, Gujarati Language and Literature, Odia Language and Literature, Sindhi Language and Literature, Tamil Language and Literature, and Telugu Language and Literature.

**Music and Fine Arts:** Interdisciplinary Research and applied musicology and aesthetics, Aesthetics and Instrumental Music, Music of Punjab, Practical aspect of Hindustani aesthetically Rag presentation, Khayalgayaki, Voice culture for singing music, Hindustani Classical Music (Vocal) Dhrupad, Dhamar, Khyal, Musical Instruments and Instrumental Music: Classical Music as well as Folk Music, rhythmic and melodic aspects in ritualistic,

folk and classical music of Kerala, RagamTanam-Pallavi, Dikshitar's kritis, javalis, Hindustani Instrumental Music.

**Netaji Subhash Institute of Technology:** Electronics and Communication Engineering, Computer Engineering, Instrumentation and Control Engineering, Manufacturing Process and Automation Engineering, Information Technology, Bio-Technology, Management, Humanities and Social Sciences, Mathematics, Physics, Chemistry

**Operational Research:** Inventory Management, Supply Chain Management, Statistics, Optimization, Mathematical Programming, Financial Management, Software Reliability.

**Persian:** Indo-Persian Literature, Persian Lexicography, Medieval Indian Culture and Sufism, Indo- Iranian Literary relations in the context of translations of classical Sanskrit and other Texts into Persian and their impact, Modern Persian Literature (Prose) and Translation and Interpretation from Persian into English and vice-versa, Persian Novel Writing in Iran and Modern Persian Literature.

**Philosophy:** Indian Philosophy, Philosophy of Religion, Human Rights, Ethics, Applied Ethics (Environmental Ethics), Development Ethics, Metaethics, Media Ethics, Feminism, Epistemology, Social and Political Philosophy, Contemporary Indian Philosophy, Philosophy of Technology, Continental Philosophy, Vedic and Vedanta Philosophy.

**Physical Education and Sports Sciences:** Exercise and Sports Psychology, Sports Exercise Physiology, Adapted Physical Activity, Sports Bio-mechanics and Kinesiology, Motor Learning and control, Comparative Physical Education and Sport, Coaching Science and Physical Fitness, Health and Wellness, Kinanthropometry, Neuro-motor Psychology, Philosophy of Sports, Political Science of Sports, Sociology of Sports, Sport Facilities, Sports Law and Sports for All, Sports History, Sports Management, Sports Pedagogy, Sports Medicine, Yogic Science, Sports Spirituality, Development of norms for various age groups of Human populations in the areas of Health and Fitness, Curriculum Development and Designing, Training Programme implementation and Development and Talent identification.

**Physics & Astrophysics:** Astrophysics, Atomic & Molecular Physics, Bio-Physics, Biological Network Cosmology, Condensed matter physics, Complex systems computational physics, Field theory, General relativity, Laser Plasma interactions, Nuclear Physics-Nuclear Structure & Reaction Dynamics, High Energy Physics, Material Science, Non-linear dynamics, , Mesoscopic Physics (Transport Quantum Dots and Quantum Wires), Spintronics, Nano-materials physics, Non-equilibrium Statistical mechanics, Particle Physics, Plasma physics, Quantum Dots, Radiation dosimetry, Radiation detector development & characterisation, Polymers, Semiconductors, Crystallography, String Theory.

**Plant Molecular Biology:** Stress Molecular Biology, Reproductive Biology, Signal transduction and photobiology, Bioinformatics, Functional genomics, Genomics and

proteomics, Transgenics for crop improvement, Small regulatory RNAs, Plant viruses, Plant biotechnology for human health, Intellectual property rights.

**Political Science:** International Relations Theory, Identity Politics and Political Violence, Gender Studies, South Asian Politics with a special focus on Pakistan & the Kashmir conflict, Public Administration, Modern Indian Political Thought, Contemporary Indian politics, Political theory, comparative politics, Indian politics, Communal Identity formations in modern India; internationalism/cosmopolitanism; history and time, South Asian Studies and Pakistan Studies, State, Constitutionalism and Democracy— Laws and their relationship with state, democracy and constitutionalism, issues of rights and people's movements, Judiciary, Election Commission, International Relations-Strategic Studies, Nuclear Weapons and Terrorism, Indian Political Economy, Indian Political System, Issues concerning communalism and secularism. Democracy, Development and Peace, sociological, economic, philosophical and cultural dimensions of political science.

**Psychology:** Research related to Dyslexia, mental retardation, hypertension, schizophrenia, depression, drug abuse, cognition in disabled children, belief systems, ageing, organizational processes.

**Punjabi:** Medieval Punjabi Literature, Modern Punjabi Literature, Classical Theories of Literature, Western Literary Theories, Media Studies, Language and Linguistics Studies, Meta Criticism, Diasporic Punjabi Literature, Inter-disciplinary Studies of Literature, Comparative Studies of Literature, History of Punjabi Language & Literature. Folklore Studies, Film Studies, Lexicography.

**Sanskrit:** Linguistics & Indian Philosophy (especially Nyaya& Vedanta), Indian Philosophy, Literature, Indian Culture and civilization and Religions, Epigraphy and Palaeography, Sanskrit Drama, Poetry, History and culture of Ancient India, Veda, Dharma Shastra& Poetics.

**Slavonic and Finno-Ugrian Studies:** The Department of Slavonic and Finno-Ugrian Studies offers Ph.D. programme in Russian Studies. The objective is to promote research in the areas of language, literature, translation, culture and comparative studies in Russian (The department presently is offering research only in the area of literature and comparative literary studies).

**Social Work:** Social work discipline, Social Work with Older persons, Social Development, Social Legislation, HRM, Ecology and Social Work, Rural and Urban Community Development, Management of Voluntary Organizations, Social Development, Social Work Education, Disaster Management, Social movements, protest movements and community organization.

**Sociology:** Folk Culture, Narrative Theory, Phenomenology and Everyday Life, Bureaucratic Institutions, Agrarian Relations, Population Displacement, Sociology in South Asia, Socio-

cultural aspects of the economy; Caste inequalities and identities in contemporary India and their relationship to social policy; Social space and its interactions with globalization; Contemporary social theory and the history and politics of the social sciences in India; South-South intellectual linkages; Higher education and social inclusion and pedagogy, Gender; Kinship; Care; State and Citizenship; Social Movements; Agrarian Structures; Sociology of Emotion; Fieldwork Methodology; Comparative Sociology, Citizenship, war and counterinsurgency in South Asia, indigenous identity and politics in India, the sociology of law, and inequality, Sociology of Education, Gender Studies, Sociology of Migration, Agrarian Social Structure, Development Studies, Tribal Studies, Kinship, caste, visual anthropology, urban sociology.

**Statistics:** Order Statistics, Fluctuation theory, Random walk, Rank order statistics, Biostatistics, Demography, Sequential Analysis, Reliability and Life-Testing, Design of Experiments, Optimization, Time Series, Reliability Models.

**Urdu:** Classical Prose, Classical Poetry, Modern Prose, Modern Poetry, Humour & Satire, Fiction, Criticism, Drama, Theatre, Mass Media and Non Fiction Prose etc.

**Zoology:** Animal Physiology, Animal Behaviour, Aquaculture, Cell Signalling, Chromatin and Cancer Biology, Computational Biology, Endocrinology, Entomology, Genomics and Metagenomics, Systematics, Evolution and Biodiversity, Microbiology, Molecular Cell Biology, Radiation Biology, Reproductive Physiology and Toxicology.

### 3.20 Research Centres

The University has 16 Centres out of which 12 have their own Ordinances in the University calendar and are listed in the Statutes of the University while eight are Specialized Centres that have grants allocated to them through various funding agencies. Three (marked with asterisk) are also Teaching Centres.

- Agricultural Economics Research Centre (AERC)
- Dr. B.R. Ambedkar Center for Biomedical Research (ACBR)\*
- Centre for Canadian Studies
- Centre for Detector & Related Software Technology
- Cluster Innovation Centre (CIC)\*
- Centre for Environmental Management of Degraded Eco System (CEMDE)
- Centre for Genetic Manipulation of Crop Plants
- Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET)
- Centre for Interdisciplinary Studies of Mountain and Hill Environment
- Centre for Science Education & Communication
- Developing Countries Research Centre
- Inter Disciplinary Centre for Plant Genomics



- Institute of Lifelong Learning (ILLL)
- Institute of Informatics & Communication (IIC)\*
- Prof. D.S. Kothari Centre for Science Ethics & Education
- Women Studies & Development Centre (WSDC)

**A brief description of major research and academic activities of the Centres is as follows:**

**Agricultural Economics Research Centre (AERC):** The Centre was established in 1954 as a maintained institution of the University under Ordinance XX-G. The Centre is funded by the Ministry of Agriculture, Govt. of India and works on issues related to agriculture and rural development in India. Some of the studies conducted by the Centre have resulted in the creation of primary database which are used by the Ministry of Agriculture as well as scholars within and outside the University. Several renowned economists have worked at the Centre and contributed substantially in the field of agricultural economic research.

**Dr. B.R. Ambedkar Centre for Bio-Medical Research Centre (ACBR):** The Centre was established in 1991 and offers courses at the level of post-graduation: M.Sc. (Bio-Medical Sciences) and Ph.D. (Bio-Medical Sciences). The interdisciplinary nature of the Centre has contributed immensely in the development of new interdisciplinary leads in the area of Chemistry and Biology. This is reflected by joint publications and continued research funding from government agencies in recognition of a fruitful amalgamation of Chemistry and Biology that is unique to this Centre of the University. The Centre has a DBT sponsored Bioinformatics Infrastructure Facility (BIF) since 2006 and is being utilized by faculty members, Ph.D. and M.Sc. students as well as by other faculty members and scientists from INMAS, IGIB, Department of Chemistry, AIIMS etc.

**Centre for Canadian Studies:** The Centre for Canadian Studies was set up in March 1992 at the University of Delhi to promote Indo- Canadian academic collaboration among faculty members, research scholars and students, particularly in the field of multidisciplinary studies. The Centre has in its nineteen years of existence succeeded in its objectives. Every year it organizes a Lester Pearson lecture in the memory of the late Prime Minister of Canada. To promote interest among students in Canadian Studies, the Centre organises an annual Pierre Trudeau memorial debate. The Centre has a programme of sending students who are pursuing post graduate professional programmes in the University to Canada for a summer internship in collaboration with the Shastri Indo-Canadian Institute and the Canada-India Business Council.

**Centre for Detector & Related Software Technology:** The Centre was established in 1988-89 under the aegis of the Department of Physics & Astrophysics. The Centre has international recognition in the Compact Muon Solenoid (CMS experiment at CERN Switzerland). It has been involved in Major International Collaborative Research Projects in Experimental High Energy Physics since 1988-89 and through the funding from the research projects, it has established experimental facilities for (a) data analysis in High Energy

Physics (b) high performance computing cluster (c) video conferencing facilities (d) silicon and gaseous detector characterization labs. The international collaboration of the Centre extends from Fermilab, US to CERN Switzerland. Faculties and students utilizing the facilities of the Centre were also involved in several important Physics results including Higgs boson, or the so called 'God Particle'.

**Cluster Innovation Centre (CIC):** An innovation - oriented centre of learning within University of Delhi with an entrepreneurial dimension, Cluster Innovation Centre offers the dynamic programmes of study with a "no boundary" concept thereby inculcating diverse opportunities and promoting the spirit of enterprise through its education, innovation and services. Activities of the centre are described in 3.16.

**Centre for Environmental Management of Degraded Eco System (CEMDE):** The two major ecosystems of Delhi - River Yamuna and Delhi Ridge - are life supporting systems of the city providing ecological goods and services to the society in the past. These are now under threat due to anthropogenic activities. The Delhi Development Authority came to rescue this natural heritage of Delhi by the establishment of Biodiversity Parks in collaboration with the Centre for Environmental Management of Degraded Ecosystems, University of Delhi. This is a major outreach programme at the University of Delhi under which a team of scientists under the leadership of Professor C.R. Babu (Professor Emeritus) has been developing a network of Biodiversity Parks through innovative approach-ecological assemblages of species that form self-sustaining communities on degraded/barren landscapes. These parks are first of their kind in India and perhaps in the world, and serve as ecological models for conservation of natural heritage in urban landscapes. In fact, the two biodiversity parks-the Yamuna Biodiversity Park and the Aravali Biodiversity Park are fully functional and serve as Nature Reserves with some 2000 species of plants and animals.

**Centre for Genetic Manipulation of Crop Plants:** The major activity of the Centre is to undertake research on genetic improvement of oilseed Brassicas through conventional and biotechnological approaches. Its major financial support has come from the National Dairy Development Board (NDDB) and DBT. The Centre is primarily working on the molecular mapping of *B.juncea*. A total of eight bi-parental DH mapping populations are being used for genome mapping and mapping of several qualitative and quantitative traits. Different marker systems (detected and developed in the lab) such as RFLP, AFLP, genomic and genic SSRs and RNA Seq-based SNPs are being used for whole genome mapping as well as target region fine mapping.

**Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET):** CIIDRET was established under Ordinance XV-A of the University in October 2015 with the main objective to develop innovative approaches towards developing diagnostics, prophylactics and therapeutics for infectious diseases plaguing India, such as Tuberculosis, Malaria, Typhoid, HIV-AIDS, Chikungunya and Dengue infections. Another objective is to make available state-of-the-art Genomic and Proteomic facilities for use by the scientific community, and to train students, research scholars and teachers in advance

techniques and technologies, beyond their regular classroom learning, through short-term and long-term courses. Yet another aim of the centre is to interact with the Biotech Industries to provide consultancy and solutions through the expertise and facilities available with scientists involved at CIIDRET. CIIDRET also promotes Industry-Academia Interaction through 'Entrepreneurship Guest Public Lecture Series', which includes lectures by entrepreneurs and the facilitators of innovation.

**Centre for Inter-Disciplinary Studies of Mountain & Hill Environment (CISMHE):**

CISMHE was established in 1990 and is recognized as a Centre of excellence/R&D Centre by the Ministry of Power, Govt. of India. The Centre is actively engaged in research on Environmental Impact Assessment (EIA) and conducting capacity studies. The Centre takes up consultancy work and the research laboratories of the Centre are supported by various corporate houses including Reliance Energy Ltd., JAY PEE Associates among others. The Centre presently has four inter-institutional collaboration projects sponsored by the Ministry of Environment, Forest and Climate Change. The project includes carrying capacity based developmental planning of national capital region (NCR), Doon Valley, Damodar river basin and Tistariver basin in Sikkim. The international outreach of the Centre includes collaboration with National University of Singapore for projects, Ecological Economics of Hydropower Development in the Himalaya, and Ecological River Impact on Himalaya.

**Centre for Science Education and Communication:** The Centre for Science Education and Communication (CSEC) at the University of Delhi was established in 1989 as a response to the changing relationship between society at large and the University. It was established to serve as an institution in which studies can be carried out by teachers and students of the University, and other interested individuals, for the generation of ideas and materials for the improvement of science education and for the promotion of a wider interest in science and scientific issues through all means of communications.

**Developing Countries Research Centre (DCRC):** Developing Countries Research Centre took shape in 1993, under the Board of Interdisciplinary Programme through Ordinance No. XV-A by the University. Since its inception, the Centre has organized major national and international seminars and conferences on themes of significant interest, sometimes in collaboration with prestigious institutions.

**Inter Disciplinary Centre for Plant Genomics:** In their efforts to sequence wheat genome as part of International Wheat Genome Sequencing Consortium, the primary task of the Interdisciplinary Centre at University of Delhi South Campus was to generate BAC end sequence data from both the ends of these BACs using Sanger technology. Till date, sequencing of 1,30,848 BAC clones has been performed from both the ends using T7 (forward) and a custom designed reverse primer, generating 2,61,696 sequences, with 2-3% error rate. In total, nearly 150Mb of wheat genomic sequences having an average read length of ~550bp per BAC end have been generated. After quality assessment of these BAC-end

sequences, these data have been analysed for repeat identification, gene content and functional annotation, identification of SSRs and compared with model grass genomes.

**Institute of Life Long Learning (ILLL):** The Institute of Lifelong Learning is dedicated to the cause of those who believe that learning is not age-bound nor classroom-bound, but it takes place throughout life and in all kinds of situations. The Institute of Lifelong Learning is a nodal agency for creation and uploading of e-Content for the Undergraduate Students of the University of Delhi. The endeavour is an attempt to provide additional quality e-material for students. To facilitate learning processes of students under UGP courses, ILLL has initiated the process to prepare e-material in form of e-lessons, e-labs, e-quizzes and e-lectures For UG courses in various subjects. This endeavour is the outcome of collective efforts of the academic community.

**Institute of Informatics & Communication (IIC):** Information Technology integrates a wide spectrum of knowledge and skill ranging from the design of computer hardware, software systems, and telecommunication to the impact of information technology on society. Institute of Informatics & Communication was established to serve as an inter-disciplinary centre for humanities, social sciences, pure and applied sciences and as a nodal point between university and various Institutions/Industries, related to communication and informatics.

**Prof. D.S. Kothari Centre for Science Ethics & Education:** In honour of Professor Kothari the University of Delhi has established the D.S. Kothari Centre for Science, Ethics and Education. The activities of the Centre include organizing lectures and workshops, including the D.S. Kothari Memorial Lecture, publishing working papers, books and other material on themes close to Professor Kothari's interests: science, ethics and various related aspects of education in India. As one of the Centre's activities, Sir John Kendrew, Nobel laureate, delivered the first Prof. D. S. Kothari Memorial lecture on November 18, 1995. In recent years, Nobel Laureate His Holiness the 14th Dalai Lama has delivered the D.S. Kothari Memorial Lecture.

**Women Studies & Development Centre (WSDC):** Women's Studies and Development Centre of Advanced Study, University of Delhi, was established in 1987 as a response of the University of Delhi to the call from the University Grants Commissions (UGC) to address women's concerns in higher education. Since then, WSDC has covered a long distance by expanding its programmes and activities. WSDC has been recognized as an Advanced Centre of Study by the UGC in 2016.

#### **40 Awards and Honours (2012-2017)**

In recognition of remarkable contribution made in their respective fields, a large number of faculty members of the University have been conferred with prestigious awards and honours.

Following are some of the awards and honours conferred upon faculty of University of Delhi in the last five years.

<b><i>Padma Shri Award</i></b>		
<b>Department of Mathematics</b>		
1	Prof. Dinesh Singh, Ex-VC, University of Delhi	Padma Shri Award by President of India, 2014
<b>Department of Persian</b>		
2	Prof. Rehana Khatoon	Padma Shri Award by President of India, 2014
<b><i>Lifetime Achievement Award</i></b>		
<b>Department of Microbiology</b>		
1	Prof. R.C. Kuhad	Life Time Achievement Award by the Association of Microbiologists of India-Platinum Jubilee.
<b>Department of Plant Molecular Biology</b>		
2	Prof. J.P. Khurana	Lifetime Achievement Award, Sci Genome Research Foundation, 2015
<b>Department of Psychology</b>		
3	Prof. N.K. Chadha	Lifetime Achievement Award in Psychology, International Conference on Multidisciplinary Healthcare, AIIMS , New Delhi
<b>Department of Sanskrit</b>		
4	Prof. Sharda Sharma	Lifetime Achievement Award, Nagaland.
<b>Department of Social Works</b>		
5	Prof. Sanjai Bhatt	Professor V.K.R.V. Rao Memorial Lifetime Achievement Award, 2017
<b><i>President/Visitor Award</i></b>		
<b>Dr. B.R. Ambedkar Centre for Biomedical Research</b>		
1	Prof. Daman Saluja	The Biotech Product & Process Development and Commercialization Award, DST, by President of India, 2013
<b>Department of Biochemistry</b>		
2	Dr. Amita Gupta	Visitors Award for Innovation for TB Detection Kit, by President of India, 2015
3	Prof. Vijay K. Chaudhary	Visitors Award for Innovation for TB Detection Kit, by President of India, 2015
		Biotech Product and Process Development and Commercialization Award, DST, by President of India, 2014
<b>Department of Hindi</b>		
4	Prof Sheoraj Singh	Subramanyam Bharti National Award, 2016 by President of India
5	Prof. Sudhish Pachauri	Subramanyam Bharti National Award, 2014 by President of India
<b>Department of Buddhist studies</b>		
6	Prof. Bhikshu Satyapala	Awarded Certificate of Honour in Paliby President of India, 2014.

<b>Department of Sanskrit</b>		
7	Dr. Balram Shukla	The Maharshi Badrayan Vyas Samman, 2013 by President of India
<b>Equal Opportunity Cell</b>		
8	Dr. Bipin Kumar Tiwary	National Award for the Empowerment of Persons with Disabilities (Role Model), by President of India, 2016
<b>Department of Hindi</b>		
9	Prof. Kusumlata Malik	Presidential Award Category for Role Model for Academic Achievements and Social Works, 2015
<b><i>J. C Bose Fellows</i></b>		
<b>Department of Biochemistry</b>		
1	Prof. Debi P. Sarkar	J.C. Bose National Fellow, 2015-20
<b>Department of Genetics</b>		
2	Prof. B.K. Thelma	J.C. Bose National Fellow, 2011-16
<b>Department of Geology</b>		
3	Prof. G.V.R Prasad	J.C. Bose National Fellow, 2015-20
<b>Department of Plant Molecular Biology</b>		
4	Prof. A. K. Tyagi	J.C. Bose National Fellow, 2007-17
5	Prof. Anil Grover	J.C. Bose National Fellow, 2015-20
6	Prof. Indranil Dasgupta	J.C. Bose National Fellow, 2017-22
7	Prof. Paramjit Khurana	J.C. Bose National Fellow, 2012-17
8	Prof J P Khurana	J C Bose National Fellow, 2013-18
<b>Department of Zoology</b>		
9	Prof. Yogendra Singh	J.C. Bose National Fellow, 2016-21
<b><i>Technology Award by DBT/DST/CSIR/ICMR</i></b>		
<b>Biological Sciences and Engineering, NSIT</b>		
1	Dr. Sanjeev Kumar	Bioenergy Award for Cutting Edge Research from DBT & IUSSTF, 2017
2	Dr. Yatender Kumar	Carrier Research Award in Life Sciences Research Board (SERB), Department of Science & Technology (DST) Govt. of India.
<b>Department of Environmental Studies</b>		
3	Dr. David Kothamasi	DST BOYSCAST Award for Research at Overseas Institute, DST, Government of India
<b>Department of Microbiology</b>		
4	Prof. J.S. Viridi	DBT-BIRAC Ideathon Award on Antimicrobial Resistance, 2016
<b>Department of Plant Molecular Biology</b>		
5	Dr. Girdhar K. Pandey	DBT-CREST (Cutting-edge Research Enhancement and Scientific Training) Award by the University of California, 2012-2013
<b><i>Fellows Elected in Prestigious Academies &amp; Awards</i></b>		
<b>Department of Botany</b>		
1	Prof. A.K. Bhatnagar	Fellow, National Institute of Ecology, Jaipur/New-Delhi

2	Prof. K.S. Rao	Fellow, Andhra Pradesh Akademi of Sciences, Amaravati, 2016
3	Prof. Ved Pal Singh	Fellow, International Society of Plant Morphologists Fellow, Linnean Society, London
4	Prof. Veena Aggarwal	Awarded fellowship of Indian Society of Plant Physiology (ISPP), India, 2013.
5	Prof Shailendra Goel	Fellow of linnean Society of London, UK, 2016
<b>Department of Chemistry</b>		
6	Prof. Rama Kant	Fellow of the Indian Academy of Sciences
<b>Department of Environmental Studies</b>		
7	Prof. Maharaj K. Pandit	Fellow, Indian National Science Academy (INSA)
		Fellow, National Academy of Sciences (2014-15)
		Fellow, Harvard University's Radcliffe Institute of Advanced Study
		Independent Director (Board of Directors) in Tehri Hydro Development Corporation (India) by GoI
8	Prof. P. Pardha Saradhi	Fellow, International Society of Plant Morphologists.
<b>Department of Genetics</b>		
9	Prof. M V Rajam	Fellow, Indian National Science Academy, India, 2015
		Fellow, National Academy of Agricultural Sciences
		Fellow, Andhra Pradesh Academy of Sciences (FAPAS).
10	Dr. Tapasya Srivastava	Member, National Academy of Medical Sciences.
	Prof. Pradeep K Burma	INSA Sunder Lal Hora Medal
		INSA Best Teacher Award, 2016
<b>Department of Geology</b>		
11	Prof. G.V.R Prasad	Fellow, The Linnean Society of London, UK, 2016.
	Prof. M. Jayananda	Fellow, Indian Academy of Sciences, Bangalore
<b>Department of Microbiology</b>		
12	Prof. R.C. Kuhad	Fellow, Biotech Research Society of India (FBRS)'
		Fellow, National Academy of Agricultural Sciences (FNAAS)'
13	Prof. R.K. Saxena	Fellow, Indian Academy of Microbiological Sciences (FAMS), India, 2014.
<b>Department of Physics and Astrophysics</b>		
14	Prof. Avinash Khare	Fellow Royal Society of Chemistry and Chem, Royal Society of Chemistry, London, 2016
		INSA Biren Roy Memorial Award Lecture, 2016
<b>Department of Plant Molecular Biology</b>		
15	Prof.Girdhar K. Pandey	Fellow, National Academy of Sciences, India, 2016.
16	Prof. J. P. Khurana	Fellow, The World Academy of Sciences (TWAS), Trieste, Italy, 2016
		Council Member: INSA & NASI

17	Prof. Paramjit Khurana	Fellow, The Third World Academy of Sciences, Trieste, Italy
<b>Department of Zoology</b>		
18	Prof. Rup Lal	Fellow, Indian National Science Academy (INSA)
19	Prof. Yogendra Singh	Fellow of Indian National Science Academy (INSA), 2013
		Fellow, Indian Academy of Microbiological Sciences (FAMI), India, 2013
20	Prof. Shibnath Mazumder	INSA Teachers Award (2013)
<b>Department of Mathematics</b>		
22	Prof. C.S. Lalitha	INSA Teachers Award (2016)
<b><i>Office Bearers of Reputed Societies/Associations</i></b>		
<b>Department of Plant Molecular Biology</b>		
1	Prof. A. K. Tyagi	President, National Academy of Sciences, India
		President, Indian Society for Plant Physiology, N Delhi (2017-18)
<b>Department of Chemistry</b>		
2	Prof. D. S. Rawat	Executive Member, Indian Society of Chemist and Biologist (2013-2015).
<b>Department of Economics</b>		
3	Prof. Pami Dua	President of The Indian Econometric Society (TIES), 2015-2016
		Vice President, TIES, 2012-2013, 2013-2014, 2014-2015.
		Appointed as Member of Monetary Policy Committee, Reserve Bank of India 2016.
<b>Department of Geography</b>		
4	Prof. R. B. Singh	Vice President, International Geographical Union (2016-2020)
<b>Department of Mathematics</b>		
5	Prof. B.K. Das	President, Academy of Discrete Mathematics and Applications, 2012
<b>Faculty of Law</b>		
6	Dr. Vageshwari	Treasurer in the All India Law Teachers Congress Association
7	Prof Usha Razdan	Scholarship by Max Planck Institute for Foreign and International Criminal Law, Freiburg, Germany, 2015
<b>Department of Zoology</b>		
8	Prof. Vinod Kumar	President Elect, Indian Society for Chronobiology; and Secretary, Indian Society for Chronobiology.
9	Prof Rup Lal	President, Association of Microbiologists of India and American Society for Microbiology Ambassador



		to the Indian Ocean region, 2012
10	Prof M. M. Chaturvedi	President of Indian Association of teachers in Biological Sciences for the year 2016
<b>Senior Administrative Positions</b>		
1	Prof. J. L. Kaul	Vice Chancellor, H.N.B. Garhwal (Central University), Uttarakhand
2	Prof. R.C. Kuhad	Vice Chancellor, Central University of Haryana
3	Prof. Kamala Sankran	Vice Chancellor, Tamil Nadu National Law School
4	Prof. S.C. Raina	Vice Chancellor, Himachal Pradesh National Law University
5	Prof Anil K Tyagi	Vice Chancellor, G.G.S. Indraprastha University, Delhi
<b>Department of Economics</b>		
6	Prof. Santosh Panda	Vice President, South Asian University
<b>Other Awards</b>		
<b>Department of Biochemistry</b>		
1	Prof. Suman Kundu	Prof. Suresh C. Tyagi Oration Award, International Academy of Cardiovascular Sciences (India Section), 2017
<b>Department of Biophysics</b>		
2	Ms. Abhishishka Srivastava	Discovery Award from Royal Society of London, 2016
3	Dr. Manish Kumar	Discovery Award from Royal Society of London, 2016
<b>Biological Sciences &amp; Engineering (NSIT)</b>		
4	Prof. A. K. Dubey	Erasmus+ Teaching Mobility Award (2016-2017)
5	Dr. Yatender Kumar	Early Career Research (Young Scientist) Award 2016 from SERB, DST
<b>Department of Chemistry</b>		
6	Prof. D. S. Rawat	Prof. SP Hiremath Memorial Award, Indian Council of Chemists, 2016
7	Dr. Neha Kapoor	Best Employee with Disability (Female) National Award, 2014
8	Dr. P. Venkatesu	Awarded Bronze Medal, Chemical Research Society of India (CRSI), Bangalore.2017
		Professor SS Katiyar endowment Lecture award 2016-17 from The Indian Science Congress Association
		Professor Suresh C Ameta Award from Indian Chemical Society, 2013
9	Dr. Ayyam Perumal Sakthivel	Dr. Sistala Kameswari Young Scientist Award, 2015
10	Dr. Sunita Bhagat	Best Chemistry Teacher, 2014
11	Prof Satish K Awasthi	Commonwealth Academic Fellowship UK
12	Prof A K Prasad	Honorary diplomat for scientific achievements and International Scientific Collaboration by Russian

		International Charitable Foundation, Moscow, Russia, 2013
13	Prof R K Sharma	Honoured by Prof YK Alagh, former Union Minister of state for Science & Technology for contribution towards incorporation of Green Chemistry in Industry and Academia in India at Central university Gujrat, 2013
<b>Department of Economics</b>		
14	Dr. Dibyendu Maiti	Ester Boserup Prize of 2016.
15	Prof. Ram Singh	Appointed as Member of the Pay Review Committee set up by the UGC and Ministry of Human Resource Development, Government of India for colleges and universities in India
16	Prof Santosh Panda	Awarded "Odisha Platinum Jubilee Award" by Governor of Odisha, 2012
<b>Department of Education</b>		
17	Dr. Anupa Sidhu	Nina Sibal Award, 2014 Shikshak Ratna Award, 2014 International Education & Leadership Summit Award, 2015
<b>Department of Geology</b>		
18	Prof. J. P. Shrivastava	Prof. William Dixon West Memorial Award, ISCA 104th Session, S.V. University, Tirupati
19	Prof. S.C. Rai	Prof. Bandaru Hema Malini Eminent Geographer's Award, 2013
<b>Department of Microbiology</b>		
20	Prof. J.S. Virdi	DBT-BIRAC Ideathon Award on Antimicrobial Resistance, 2016 Invitrogen Science Hero Award in the category Best Lab Mentor, 2016
21	Prof T Satyanarayana	Malaviya Award of Biotech Research Society, India 2012
22	Prof R. C. Kuhad	Dr. G.B. Manjrekar Award by AMI 2014
<b>Department of Plant Molecular Biology</b>		
23	Prof. J.P. Khurana	Prof S S Katiyar Endowment Lecture award in Indian Science Congress Association meeting, 2013 Prof. Jatis Chandra Sengupta Endowment Lecture Award by the West Bengal Academy of sciences & Technology in 2014 H C Arya Memorial Gold medal by Plant tissue Culture Association of India, 2015 Prof. S.K. Sinha Memorial Lecture Award, Indian Society of Plant Physiology, 2017.
24	Prof. Paramjit Khurana	Shri Ranjan Memorial Lecture Award, National Academy of Sciences, India, 2014

		Prof Archana Sharma Memorial Award by Indian Science Congress Association, 2012
		Birbal Sahni Medal of the Indian Botanical Society, 2017
25	Prof Anil Grover	Biotech Product and Process Development and Commercialization Award
26	Dr. Surekha Katiyar Agarwal	Awarded Innovative Young Biotechnologists Award 2012
<b>Department of Zoology</b>		
27	Prof. Rup Lal	Prof. S.R. Vyas Memorial Award from the Association of Microbiologists, India, 2014
		Prof. B.N. Johri Award on Microbial Diversity (Biannual) by the Association of Microbiologists of India, 2016
		Moselio Schaechter Distinguished Service Award-2016 from American Society for Microbiology
		Professor S. S. Katiyar Endowment Lecture Award from the Indian Science Congress Association, 2016-2017
		Kuldeep Dhatwalia Excellence Award-2017 from Chaman Seva Sansthan (HP)
28	Prof. Yogendra Singh	Best Mentor Award from Indian Institute of Science, Bangalore, 2017
		Moselio Schaechter Distinguished Service Award from American Society for Microbiology, 2014
<b>Department of Hindi</b>		
29	Dr. Alpana Mishra	Valmiki Katha Samman, 2017
	Dr. Vinod Tiwari	Vanmali Katha Alochna Samman, 2016
		Devishankar Awasthi Alochna Samman-2013
30	Dr. Sheoraj Singh	State Level Award from Delhi Government on the eve of Constitution day 26 <sup>th</sup> November, 2015
		Vikram-Kalidas Award (MP Government) by Vikram university Ujjain, 2016
31	Dr. Mukesh Garg	Ambedkar National Award for “Katha Sahitya ewam dalit patrakarita”
32	Prof Prem Singh	Hindi Bhasha Bhushan Samman from Sahitya Mandal Nath and National Award “Creative Person”
<b>Department of History</b>		
33	Prof. Sunil Kumar	Global South Award, 2014
		Allianz Distinguished Visiting Scholar in Islamic Studies, Institute for Near and Middle Eastern Studies, Ludwig Maximilian’s University, Munich,

		2015
<b>Department of Sanskrit</b>		
34	Dr. Ranjan Kr. Tripathi	Yuva-Pratibha Vidvad Alankaran Award by Akhil Bhartiya Vidvarthi Parishad, Varanasi, 2016
35	Dr. Bhartendu Pandey	Vidwad bhooshan by Kashi Vidvad Parishad, Varanasi, 2015
36	Prof. Ramesh Chandra Bharadwaj	Vidyananda Vedic Award by Arya Pratinidhi Sabha, New Delhi, 2015 Sanskrit Vidya Martanda by Sanskrit Academy, Delhi
37	Dr. Meera Dwivedi	Sanskrit Sahitya Puraskar Akhil Bhartiya Sanskrit Natya and Lekhan vikram Kalidas Puraskar
<b>Department of Mathematics</b>		
38	Prof. Dinesh Singh	Honorary Doctorate degrees: University of Edinburgh; National University of Ireland, Cork; University of Houston, Houston, Texas (U.S.A.); National Institute of Technology, Kurukshetra (Haryana)
39	Prof B. K. Das	Member of Planning Committee of DST for five years project (2012-2016) on “National meet of Research Scholars in mathematical Sciences” Ambassador of NANUM 2014 & ICM 2014 (International Congress of Mathematics 2014) representing South and west Asia including Indian subcontinent to be held in Seoul Korea, 2014
<b>Department and Slovanic &amp; Finno-Ugarian Studies</b>		
40	Prof. Chander Shekhar	Fakhrudin Ali Ahmad Ghalib Award, 2013
41	Dr. Rashmi Joshi	“The Golden Laurel” Award from Government of Bulgaria for her contribution to the Bulgarian Studies, 2014
<b>Department of Psychology</b>		
42	Prof N K Chadha	Global Practitioner of the year for Career Development ny National Career Development association (USA), 2015
<b>Library &amp; Information Science</b>		
43	Dr. K. P. Singh	Distinguished Library Science Teacher-2016 by Delhi Library Association
<b>Faculty of Music &amp; Fine Arts</b>		
44	Prof. Anupam Mahajan	Awarded Rag Ragini Shree Samman, Delhi 2013 STRING Steps Global Award of Excellence by STRING and Steps Organization, Delhi, 2017

45	Prof. Deepti Omchery Bhalla	Nritya Kala Shikhamani from Delhi Karnataka Sangeeta Sabha and Tirupati Tirumala Devasthanam, Tirupati, 2017.
46	Prof. Ojesh Pratap Singh	Sur Srijan Shikhar Samman by Pandit Tilak Raj Sharma Trust, Delhi for the year 2016-17 Gaan Ratna Samman by Sangeet Sabha, Pathankot for the year 2015-16
47	Prof. Prateek Chaudhari	Smt. Shanti Devi Samman, 2016
48	Prof. Suneera Kasliwal	Marwar Ratna Padmashri Komal Kothari Award by Meherangarh Museum Trust, Jodhpur, 2015& 2016
49	Prof. Deepti Bhalla	Sangeeta NrityaVisharada by Irayimman Tampi Trust, 2015
		Narada Gana Sabha award, Chennai, 2015
		Nritya Kala Shikhamani from Delhi Karnataka Sangeeta Sabha and Tirupati Tirumala Devasthanam Tirupati, 2017
50	Prof TV Manikandan	Awarded “Asthana Vidhwan” Sri Kanchi Kamakoti Mutt, Kanchipuram, Tamil NaDU, 2013 “Printania Award” from Navasadhana Sangeet Samiti Banaras Awarded “Malliyoor Sangita Brungam”, 2015
51	Prof Uma Garg	“Sangeet Shree Award” by the Art & Culture Trust of India “Chakrapani’s World School of Music” 2014 Awarded Baba Allauddin Khan Award” 3013
52	Dr. P. B. Kannakumar	Conferred with “Sangeeta Kovidha” by Gayatri Fine Arts, Delhi, 2014 Sri Kanchi Kamakoti Peetam Asthan Vidwan” by Sri Jayendra Saraswati Sangeeta Vidwat Sabha, TN 2014 Awarded the Title “Isai Gnana Sudaroli” by the organisation Apoorva Ragam
<b>Operational Research</b>		
53	Prof. Chandra K. Jaggi	IEOM Outstanding Service Award-In Recognition appreciation of outstanding Support, Service, contributions - Global Community Engagement in Industrial Engineering and Operations
<b>Department of Commerce</b>		
54	J P Sharma	“Shiksha Gaurav puraskar” awarded by Centre for Education Growth and Research, New Delhi , 2014  Member of Managing Committee, Centre for Corporate Governance Reserch and training, Mumbai
<b>Modern Indian Languages and Literary Studies</b>		
55	Prof. P.C. Pattanaik	Conferred with the title, REN (Scholar of Lepcha

		language and Culture) by the Mayel Lyang Lepcha Development Board, Government of West Bengal.
56	Dr. K. Premananthan	Best Translation Award, by Thisaiyettum Magazine-Nalli Foundation, Chennai
<b>Department of Urdu</b>		
57	Prof. S.A. Karim	Appointed as Director, National Council for Promotion of Urdu Language
<b>Adult Continuing Education and Extension</b>		
58	Prof J P Dubey	Best Educationist award by Newspaper Association of India
<b>Department of East Asian Studies</b>		
59	Prof Anita Sharma	For achievements in the field of Peace by International Women's Club, Sydney, Australia, 2017.
		Second World Buddhist Outstanding Award, Government of Thailand, 2015
		World Fellowship of Buddhist Youth, Government of Thailand, 2015
<b>Physical Education &amp; Sports Sciences</b>		
60	Dr.Pardeep Kumar	World Fellowship of Buddhist Youth, Government of Thailand, 2015
61	Dr. Rakesh Gupta	Appointed as Director, Selection Committee by the Ministry of Youth Affairs and Sports, Government of India to select Indian para Athletics team to represent India in the Rio Paralympics games held at Rio Brazil in 2016
<b>Department of Botany</b>		
62	Prof. S. Mazumdar	Distinguished Alumna Award from Miranda House Alumni Association, Delhi University, 2017
63	Prof. Veena Agrawal	'Scientist of Eminence Award, 2016' by Society of Plant Research
64	Prof. Anu K. Pandey	Panchanan Maheshwari Medal by Indian Botanical Society, 2015
65	Prof A K Bhatnagar	Fellow of National Institute of Ecology, Jaipur
<b>Department of Geography</b>		
66	Prof. Anu Kapur	The Amartya Sen Award for Advancement of Knowledge of Social Sciences, 2012
<b>Department of Sociology</b>		
67	Prof. Nandini Sundar	Ester Boserup Prize, 2016
68	Prof Satish Deshpande	"The Malcolm Adiseshiah" Award for contribution to Development studies, 2012
<b>Department of Political Science</b>		
69	Prof. Sunil Chowdhary	Pearson Award in Higher Education, 2014 Global South Award by International Political Science Association, 2014
<b>NCC/NSS</b>		

70	Capt Parminder Sehgal	Recognition Award for Services in Matdata Mahotsav, 2016
<b>Centre for Science Education and Communication</b>		
71	Deepika Bhaskar	Teacher's Excellence Award, 2016
<b>Faculty of Technology</b>		
72	Prof. Purna Gaur	Outstanding Branch Counsellor Award by IEEE Section, New Delhi, 2016.

## **5. Promoting Research and Innovation in the University of Delhi**

As a research-intensive university, the University of Delhi constantly strives for achieving international distinction through excellence in research and innovation to address global, national and societal challenges.

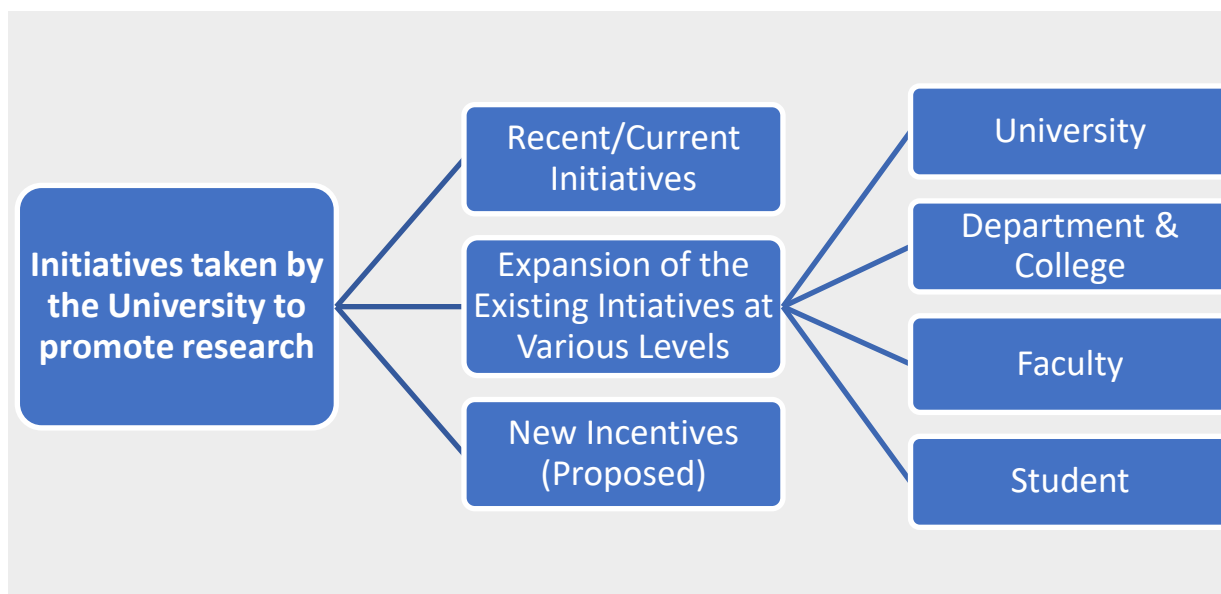
Towards this endeavour, University of Delhi is committed to encourage research initiatives across all disciplines. The prime objectives for incentivizing research are as follows:

- Develop a congenial research environment to ensure high quality of research with greater focus on outcome based research
- Strengthen linkages by expanding national and international collaborations and partnerships with key academic institutions, industry, government, policy makers and sponsors of research
- Promote a culture of innovation and entrepreneurship in every sphere of knowledge
- Provide robust and flexible infrastructure conducive to research
- Enhance overall research funding, both extramural and intramural
- Support and encourage faculty and students in developing and advancing their research potential
- Encourage Undergraduate Research Initiatives and foster systematic integration of the research experience in undergraduate Programmes, leading to research-based learning in the academic disciplines across the institution.

The Research Initiatives are divided into three categories, as follows:

- Current Initiatives
- Expansion of Existing Initiatives (Proposed)
- New Incentives (Proposed)





## 5.1. Recent/Current Initiatives

- **Research & Development Grant for Department Faculty:** R & D grant was instituted by the University to bolster the ongoing research programs across departments. This scheme was very helpful in supplementing the support to faculty who have large extramural grants, and was absolutely necessary to many others who have none or limited extramural support especially in non-science subjects. While the grants have not been awarded recently, efforts are being made to generate new sources of funds for continuation of the scheme.
- **Innovation Projects for College Teachers:** A first scheme of its kind in the country, popularly known as ‘Innovation Projects for Colleges’, was initiated in 2012, with an aim to promote undergraduate and interdisciplinary research through University funding. The thrust of this progressive and highly successful venture has been to develop a conducive environment for research in colleges and inculcate innovative thinking in students. The scheme was structured to encourage and support hands-on trans-disciplinary research which promotes synthesis of ideas and integrative learning and helps lead college students and teachers to move beyond subject boundaries. While the grants for innovation projects have not been awarded in the immediate past, attempts are being made to generate new sources of funds to enable continuation of this novel scheme.

▪ **Excellence Awards for Department Faculty and College Teachers:**

Department faculty and college teachers receive Excellence Awards at the Foundation Day of the University every year for outstanding contribution to research and teaching.

▪ **Seed Grant to New Faculty:** The University of Delhi offers seed grant as a one-time grant to each new faculty member recruited in the University. This is done to help initiate their research engagement through the establishment of requisite research facilities.

▪ **Publication Charges:** Limited support is provided towards publication charges of papers that are published in peer reviewed journals.

▪ **Dedicated Finance Branches for Major and Minor Research Projects:** The University has allocated responsibility to distinct finance branches and dedicated staff for handling major research projects, minor research projects, university grants and other aspects related to research projects.

▪ **Travel Grants to students for attending International Conferences /Workshops/ Summer School / Short term training:** In order to encourage students to attend international conference/workshop/summer school to present their research work, or to undertake short term training, the University extends partial financial support towards air fare and registration fees.

▪ **IPR Cell, Patent Fund:** The University has an Intellectual Property Rights Cell and a Patent Fund to support the intellectual property filing needs and awareness generation in the area. The University also had an IPR Chair instituted by MHRD that was functioning at the University for the past few years and has held various training programmes and conferences to promote the research culture.

▪ **Research Journals:** The University of Delhi publishes two e-journals:

- The Delhi University Journal of Undergraduate Research and Innovation (ISSN 2395-2334), an online bi-annual peer reviewed research journal (first of its kind in India). <http://journals.du.ac.in./ugresearch/index.html>
- The Delhi University Journal of the Humanities and the Social Sciences (ISSN 2348-4357), peer- reviewed research journal. <http://journals.du.ac.in./humsoc/index.html>

In addition, there are several other journals which are published by departments and colleges. These are:

- Indian Economic Review (Department of Economics) ISSN: 0019-4670 (print version), ISSN: 2520-1778 (electronic version). <https://www.springer.com/economics/journal/41775>
- Journal of Commerce and Business (Department of Commerce) ISSN 2322-0767, <http://www.journal.commerce.du.ac.in/>
- *Vageeshwari* (Department of Music) ISSN: 0975-7872
- Indian Law Journal
- Indian Journal of African Studies (Department of African studies). <http://as.du.ac.in/publications.html>
- Journal of Law Teachers of India (Faculty of Law), ISSN 2231-1580. <http://law.du.ac.in/research--journal.html>
- Indian Journal of Chest Diseases & Allied Sciences (VPCI), ISSN 0377-9343. <http://www.vpci.org.in/journal.php>
- Yearly Review (Department of English),
- Journal of Library and Information Science (Library and Information), ISSN:0970-714 X, <http://dlis.du.ac.in/JLIS.htm>
- Phytomorphology (Department of Botany) ISSN 0031-9449, <http://ispm.co.in/phytomorphology.html>

While the University publishes the above journals, strengthening the quality of these is of paramount importance.

- **STAR Innovation Projects:** The scheme of Star Innovation Projects was launched by the University to support colleges that have shown potential for high-quality research. Based on a rigorous screening process, a select number of colleges showing high quality research potential were given grants to strengthen their infrastructure and research facilities.
- **Research Centres in Colleges:** Several research Centres have been established in the colleges to provide further impetus to research activities (e.g. the D S Kothari Centre for Research and Innovation in Science Education at Miranda House).
- **International and National Collaborations:** The University has established linkages by expanding national and international collaborations and partnerships with key academic institutions, industry, government, policy makers and sponsors of research. A University-Industry Interaction Cell may be established to contribute to the socio-economic development of the country through collaborations and partnerships with industry. The Cell may promote

interaction between academics and industry through mutual co-operation amongst teachers, scientists, researchers and the practicing industrialists to fill the gaps between knowledge creation and its application. It may define thrust areas of collaboration, promote university-industry linkages and create a database of collaborating industries.

- **Emeritus Professor:** In order to benefit from the invaluable experience and expertise of the faculty members of the University who are superannuated having an excellent track record of outstanding research achievements, positions of Emeritus/Superannuated Professor are considered.
- **Visiting Professorship:** Outstanding and accomplished scientists and academicians with robust research record are invited to contribute to the ongoing research programmes.
- **Visiting Fellowship:** Fellowships are offered to experienced academicians who can add a new dimension to the University by their experience and expertise in a particular area.
- **Research Ethics and Integrity Policy:** The University complies with the research ethics and guidelines of various government agencies for use of humans and animals in research, safety guidelines for use of hazardous material like radioactive material, chemicals, genetically modified organisms etc.

## 5.2 Expansion of the existing initiatives at various levels (Proposed)

### University Level

- **Enhanced Support for Publication Charges of Research Papers accepted in high impact factor journals.**
- **Support for Publication Charges of Books from Renowned Publishers:** The faculty members who get acceptance for publication of their high quality work with prestigious publishers may be provided financial support for publication.

- **Increased Opportunities for Departmental Research** by expanding University grants like Research & Development Grant for the departmental faculty.
- **Enhanced Seed money for new faculty joining the University of Delhi** keeping in mind the nature of their research work and the requirements.
- **Connecting Researchers:** To nurture, strengthen and build strong relationships and partnerships with other academic institutions, industry, government, policy makers and sponsors of research both in India and abroad, the University may impart funding support to researchers engaged in inter-department research projects.
- **To create a road map for establishment of Centres of Excellence in defined research areas:** Efforts may be made for collaborative research with other institutes/agencies of national relevance to conduct research in strategic areas of national importance and ensure joint funding for cutting-edge research. Adequate space may also be provided to set up such centres and benefit from extramural support.
- **Expansion and Upgradation of Central Instrumentation Facilities/Departmental Central Research Facilities** and making them accessible to all departments and colleges. The present facilities may be revamped and new facilities may be added as hubs for sophisticated, advanced and expensive equipment to be centrally located for the benefit of the university/college faculty and students.
- **Promoting Effective Documentation of Research** on the departmental websites that have active link with the main university website including progress reports, publication details and data update on a quarterly basis.
- **Procurement of more journals of international repute in the libraries** with extended access to faculty and students via internet.
- **Access to turnitin to each faculty member** to ensure that the articles being published are original and faculty and students are sensitised about it.

- **An elaboration of existing lecture series** and its strengthening commensurate with research activities of different Departments.
- **Additional support for visitors from renowned institutions in India and abroad** for one or two semesters.
- **Improvement in Governance:** (i) improvement in decision making process, (ii) mechanism to sustain programmes even in economically lean periods, (iii) simplification of procedures to carry out research based on feedback, consultation and trust.

#### Department and College Level

- **Continuously improve research training and enhance research skills** by organizing workshops, training programmes for students and faculty from colleges regarding research methodology, writing proposals, management of research projects, dissemination of research findings, writing of papers, etc. Emphasis should be laid on academic integrity and ethical practices in research. Enhanced support for organizing national and international conferences/workshops/seminars may be provided. In order to inculcate a culture of innovation and entrepreneurship in young minds, skill enhancement training Programmes must be organized at regular intervals.
- **Enhanced opportunities for Undergraduate Research Initiatives** that encourage innovation, entrepreneurship, prestigious publications, patents etc. by initiatives like expansion of Innovation Projects. Active involvement and mentorship by the University department faculty is crucial for developing a research culture at the college level.

#### **Travel Grant for college teachers to present research papers in international conferences**

#### Student level

- **Travel Grant support for students** to present papers in International Conferences and attend Summer Schools and Workshops through Vice Chancellor's Student Fund.
- **Summer Undergraduate Research Programme:** The objective of the Programme is to provide undergraduate students with an opportunity to work in a research laboratory in the summer in order to promote research at the undergraduate level with the possibility of

continuing through the following academic year. To achieve this, active participation of faculty and other researchers in the University is crucial.

### **5.3 New Incentives (Proposed)**

- **Incentives and support for the Development of Broad, Multi-Disciplinary Research:** Taking initiative to establish Institutes and Centres and support research in interdisciplinary areas that will position the University as a national leader in emerging and frontier areas of research.
- **Increased support for Outcome Based Research** in strategic priority areas of global, national and social relevance leading to an innovation and resulting in an entrepreneurial venture.
- **Establishment of University-Industry Interaction Cell:** A University-Industry Interaction Cell may be established to contribute to the socio-economic development of the country through collaborations and partnerships with industry. The Cell may promote interaction between academics and industry through mutual co-operation amongst teachers, scientists, researchers and the practicing industrialists to fill the gaps between knowledge creation and its application. It may define thrust areas of collaboration, promote university-industry linkages and create a database of collaborating industries.
- **Support for Multi-centric Outcome Based Mega Projects** on problems of international, national and social importance that cut across disciplines, departments and colleges; involve faculty and students at all levels; having national as well as international collaborations/consortia.
- **Maintenance Grant for research labs/equipment in the University:** Expensive equipment bought by Central facilities and various departments has high maintenance cost and generally cannot be routinely maintained with individual grants of faculty members. This grant will enable proper functioning of existing facilities.

- **Resource Centres and Digital Resource Libraries:** In an attempt to enhance the quality of research, special digital libraries/resource centres may be established for researchers with facilities such as individual accounts for storage of research data and access to digital resources and databases from all across the world.

- **Research Excellence Awards for Department/College Faculty:** Research Excellence Awards in the form of Certificate of Recognition and Research Grant may be given in two categories:

- Research Excellence Award for faculty below the age of 45 years
- Research Excellence Award for faculty above the age of 45 years

The awards will be based on excellence in research including publications, extramural grants, patents, collaboration with industry, other recognition, etc.

- **Additional research grants for exceptional research performance, filing patents, technology transfer to industry:** Incentives in the form of additional research grants and facilities may be provided to faculty members showing exceptional research performance, publishing in prestigious journals, making efforts for collaborative research, filing patents and taking the research to the level of technology transfer and making significant contribution to meet societal, national and global challenges.



## ANNEXURES

### ANNEXURE-I

Ordinance VI for the Procedures for the award of Master of Philosophy (M.Phil.) and Doctor of Philosophy (Ph.D.) Degree conforms with UGC Gazette Regulations, 2016.

<http://www.du.ac.in/du/index.php?page=ordinances-and-guidelines-related-to-research>

### ANNEXURE-II

**Academic Integrity and Prevention of Plagiarism:** Plagiarism is defined as an ‘act of academic dishonesty and breach of ethics. It involves using someone else’s work as one’s own’. The University Grants Commission, Govt. of India, has set guidelines to ensure academic integrity and eliminate plagiarism from higher educational institutions in India as per the *University Grants Commission (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulations, 2018*. These apply to students, researchers, faculty and staff in these institutions.

[https://www.ugc.ac.in/ugc\\_notices.aspx?id=2079](https://www.ugc.ac.in/ugc_notices.aspx?id=2079)

### ANNEXURE-III.

**Guidelines for Sponsored Research Projects:** The University facilitates the acquisition of grants from extramural sources by providing a structured mechanism for submitting research proposals and their implementation after sanction through well-defined guidelines for Sponsored Research Projects. These comprehensive guidelines form the basis for the smooth operation of all aspects of the research project activity, such as release of grants, appointment of staff, purchase of equipment, periodic budget review and final submission of utilization certificate.

<http://www.du.ac.in/du/index.php?page=ordinances-and-guidelines-related-to-research>

### ANNEXURE-IV

**Link to total patents applications filed and granted:**

<http://www.du.ac.in/du/uploads/Patents.pdf>

### ANNEXURE V

**Link to patents applications filed and granted during 2012-2017:**

[http://www.du.ac.in/du/uploads/Patents\\_2012-2017.pdf](http://www.du.ac.in/du/uploads/Patents_2012-2017.pdf)

## ANNEXURE VI

S. No	Organization with which MoU is signed: Name of the Institution/ Industry/ Corporate house	Year of signing MoU	Duration
1.	Hankuk University of Foreign Studies, South Korea (Linguistics)	1993	Ongoing
2.	University of Heidelberg, Germany	January 2000	Ongoing
3.	Heidelberg University (Germanic & Romance Studies)	2000	
4.	University of Navarra, Pamplona (Germanic & Romance Studies)	2005	12
5.	Freie University Germany	June 2007	Ongoing
6.	University of Helsinki, Finland	October 2007	Ongoing
7.	University of Wroclaw, Poland	May 2007	Ongoing
8.	Center of Excellence (DBT) (Plant Molecular Biology) A collaborative project between University of Delhi South Campus and Maharashtra Hybrid Seed Company Ltd	2007-2013	6 Years
9.	Universite Jean Moulin Lyon 3, France	January 2008	Ongoing
10.	University of Bradford, UK	May 2008	Ongoing
11.	Korea University, Korea	November 2009	Ongoing
12.	University Paul Valery Montpellier 3, France	May 2009	Ongoing
13.	Indian Grassland and Fodder Research Institute, Jhansi, Uttar Pradesh (Botany)	2009	3 Years
14.	University of Montpellier-III (Germanic & Romance Studies)	2009	8 years
15.	University of Wuppertal, Germany (Germanic & Romance Studies)	2009	8 years
16.	Freie University, Berlin, Germany (Germanic & Romance Studies)	2009	8 years
17.	Potsdam University, Germany	2009	8 years
18.	Bielefeld University, Germany	March 2010	10 years

19.	Fudan University, China	April 2010	Ongoing
20.	The Georg-August-Universitat Gottingen, Germany	April 2010	10 years
21.	University of Edinburgh, UK	October 2010	Ongoing
22.	Bielefeld University, Germany (Germanic & Romance Studies)	2010-14	4 years
23.	ARIES, Nainital (Physics)	2010	Ongoing
24.	GSI-Germany and other Institute from Europe	2010-11	Ongoing
25.	University of Potsdam, Germany	February 2011	7 years
26.	Department of Biotechnology, Government of India (Botany)	2012-2013	5 Years
27.	JMI (CIC)	2012-2013	Ongoing
28.	University of Aizu, Japan (Computer Science	2012-2013	5 Years
29.	Mitsubishi Corporation (East Asian Studies)	2012-2016	5 Years
30.	Korea Foundation (East Asian Studies)	2012-2013	4 Years
31.	DRDO (Mathematics)	2012-2013	Ongoing
32.	National Dong Hwa University, Taiwan (Physics)	2012-2013	Ongoing
33.	Biotechnology Industry Research Assistance Council (BIRAC) (Plant Molecular Biology) Nirmal Seeds, Pachora, Maharashtra	2012-2013	5 Years
34.	AbaiKazk National Pedagogical University, Kazakhstan (2012)(Slavonic & Finno-Ugrian Studies) Department of Slavonic and Finno-Ugrian Studies, University of Delhi	2012-2013	5 Years
35.	Ataturk University, Turkey	October 2013	5 years
36.	Kadir Has University, Turkey	October 2013	5 years
37.	Carleton University, Canada (Philosophy)	2013-2014	5 Years
38.	The Ecole Normale Superieure (ENS), Paris	February 2013	5 years
39.	Universite Libre de Bruxelles, Belgium	October 2013	5 years
40.	University of Aizu, Japan	October 2013	5 years
41.	IIT, Bombay (CIC) eYantra	2013-2014	3 years

42.	PHD Chamber of Commerce & Industry, and I am SME of India (CIC)	2013-2014	2 Years
43.	Epitech University, France (Computer Science)	2013-2014	3 Years
44.	Seoul National University, Korea	May 2013	5 years
45.	Copenhagen Business School, Denmark	April 2014	5 years
46.	InstitutD' Etudes Politeques de Paris, France	February 2014	5 years
47.	Japan Advanced Institute of Science & Technology, Japan	April 2014	4 years
48.	University of Glasgow, UK	May 14, 2014	5 years
49.	University of Michigan, USA	May 2014	5 years
50.	University of Oslo, Norway	February 2014	5 years
51.	JAIST (Japan Advanced Institute of Science and Technology, Japan) (Chemistry)	2014-2015	5 Years
52.	Ben-Gurion University of the Negev (BGU), Beer Sheva, Israel	October 2015	5 years
53.	IDC, Herzilya, Israel	October 2015	5 years
54.	Isra University	October 2015	4 years
55.	King's College London, UK	September 2015	5 years
56.	M.V. Lomonosov Moscow State University, Russia	May 2015	5 years
57.	Russian State University for the Humanities, Moscow	October 2015	5 years
58.	Osaka University, Graduate School of Language and Culture/School of Foreign Studies, Japan	October 2015	5 years
59.	University of Jordan, Jordan	October 2015	4 years
60.	University of Leiden, Netherlands	October 2015	5 years
61.	University of Pecs, Hungary	August 2015	5 years
62.	The Hebrew University of Jerusalem, Israel	October 2015	5 years
63.	University of Turin, Italy	October 2015	5 years
64.	University of Würzburg, Germany	September 2015	5 years
65.	Geological Survey of India (Geology)	2015-2016	2 Years
66.	University of Turin, Turin, Italy (Germanic & Romance Studies)	2015-2016	2 Years

67.	TATA Power Delhi Distribution Ltd. (CIC)	2015-2016	3 years
68.	UGC DAAD J .M. University, Wurzburg , Germany (Adult Continuing Education & Extension)	2015-2016	5 Years
69.	Collaboration with University of Pecs Hungary (Slavonic & Finno-Ugrian Studies)	2015-2016	5 Years
70.	Moscow State university (Slavonic & Finno-Ugrian Studies)	2015-2016	5 Years
71.	Russian State University for Humanities (Slavonic and Ugrarian Studies)	2015-2016	5 Years
72.	University of Glasgow, Glasgow LITUP (English)	2016-2017	6 Years
73.	University of Potsdam, Potsdam DEE ( English)	2016-2017	4 Years
74.	University of Tokyo, Japan	May 2016	5 years
75.	School of Social Welfare, UC Berkeley (Social Work)	2016-2017	1 Year
76.	Leiden University (Sociology)	2016-2017	5 Years
77.	ESC Pau , France (Financial Studies)	2006-2017	11 years
78.	Philipps-Universitat Marburg, Germany	July 2017	5 years
79.	National Chung Chen University, Taiwan	October 2017	5 years
80.	State University of New York at Oswego, USA	October 2017	5 years
81.	Taipei Economic and Cultural Centre in India, Taiwan	June 2017	1 year
82.	Universidad Externado de Colombia, Spain	June 2017	5 years
83.	University of Copenhagen, Denmark	September 2017	5 years
84.	University of Sheffield, UK	May 2017	2 years
85.	Xaingtan University (Sociology), Hunan, China	Till date	5 Years
86.	DRDO (Physics)		ongoing
87.	Tomsk State University (Slavonic & Finno-Ugrian Studies)		

## ANNEXURE VII

### Linkages established by the University with Institutions/Industry for Dissertation, Project work, Research collaboration etc. (2012-2017)

#### Academic and Research Collaboration with Universities/Industry/Research Institutes

<ul style="list-style-type: none"> <li>Allagappa University, Karaikudi</li> <li>Banaras Hindu University (BHU), UP</li> <li>Bhaba Atomic Research Centre (BARC), Mumbai</li> <li>Center for Emerging diseases, Jaypee Institute of Information Technology, UP.</li> <li>Central University of Rajasthan</li> <li>CSIR Institute of Genomics and Integrative Biology, New Delhi</li> <li>DBT India and Maharashtra Hybrid Seed Company Ltd</li> <li>Defence Research and Development Organisation (DRDO), New Delhi</li> <li>G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand</li> <li>Genome Informatics Research Group, Bionivid Technology Pvt. Ltd., Bangaluru.</li> <li>Indian Institute of Technology (IIT), Delhi</li> <li>Indian Association for the Cultivation of Science, Jadavpur, Kolkata</li> <li>Indian Institute of Technology (IIT), Roorkee</li> <li>Indian Institute of Technology (IIT), Chennai</li> <li>Indian Space Research Organisation (ISRO), Tiruvananthapuram</li> </ul>	<ul style="list-style-type: none"> <li>Indra Gandhi Research Centre for Atomic Research, Kalpakkam</li> <li>Institute of Plasma Research, Ahmedabad</li> <li>Institute of Cytology and Preventing Oncology (ICPO), Noida</li> <li>Institute of Life Sciences (ILS), University of Hyderabad</li> <li>Institute of Nuclear Medicine &amp; Allied Sciences (INMAS), Delhi</li> <li>International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi</li> <li>Inter-University Accelerator Centre, New Delhi</li> <li>Inter-University Centre for Astronomy and Astrophysics, Pune</li> <li>Indian Space Research Organization (ISRO)</li> <li>Jawaharlal Nehru University (JNU), New Delhi</li> <li>M/s Lead Invent Technologies Pvt. Ltd.</li> <li>National Brain Research Center (NBRC), Manesar, Haryana</li> <li>National Institute of Immunology (NII), New Delhi.</li> </ul>	<ul style="list-style-type: none"> <li>National Physical Laboratory (NPL), New Delhi</li> <li>Nirmal Seeds, Pachora, Maharashtra</li> <li>Physical Research Laboratory, Ahmedabad</li> <li>Rajiv Gandhi Centre for Biotechnology, Kerala</li> <li>Saha Institute of Nuclear Physics, Calcutta</li> <li>Solid State Physics Laboratory, New Delhi</li> <li>Tata Institute of Fundamental Research, Mumbai</li> <li>UGC- DAE Consortium for Scientific Research, Calcutta</li> <li>UGC-DAE Consortium for Scientific Research, Indore</li> <li>University of Tempere, Finland</li> <li>Ural Federal University, Russian Federation</li> <li>Vaccine and Infectious Disease Research Centre, THSTI, Gurgaon</li> <li>Variable Energy Cyclotron Centre, Calcutta</li> </ul>
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Industrial Internships	Dissertation/ Project work	
<ul style="list-style-type: none"> <li>• IBM Research Lab, Delhi</li> <li>• Pitney Bowes</li> <li>• KPMG</li> </ul>	<ul style="list-style-type: none"> <li>• AirIndia, Indrapratha Gas Ltd., Cococola, SSPL, MTNL, Faridabad power plant etc.</li> <li>• AUF</li> <li>• Bielefeld University, Germany</li> <li>• CBT/IGIB</li> <li>• Central Schools, Delhi Govt. Schools (DOE)</li> <li>• DIPAS</li> <li>• GSI, Faridabad</li> </ul>	<ul style="list-style-type: none"> <li>• Heidelberg University</li> <li>• INMAS</li> <li>• Potsdam University, Germany</li> <li>• SAC (ISRO), DEAL (DRDO), SAMEER, BEL, CSIR-NPL</li> <li>• University of Montpellier III</li> <li>• University of Navarra</li> <li>• University of Turin, Turin, Italy</li> <li>• University of Wuppertal, Germany</li> <li>• VPCI</li> </ul>

## ANNEXURE VIII

National collaborative activities for Research, Faculty exchange, Student exchange	
<ul style="list-style-type: none"> <li>• CSIR-CCMB</li> <li>• CSIR-IGIB</li> <li>• ICGEB</li> <li>• Industry Interaction (DSS Imagetech Pvt Ltd)</li> <li>• Kashmir University</li> <li>• Manipur University</li> <li>• PGIMER</li> <li>• Safdarjung Hospital</li> <li>• AIIMS</li> <li>• AIIMS; UCMS</li> <li>• Aman Trust</li> <li>• Ambedkar University</li> <li>• Amity University; Indraprastha University</li> <li>• Assam Agricultural University, Jorhat, Assam</li> <li>• Mira's College of Girls Pune</li> <li>• Tata Institute of Social Sciences Mumai, Maharashtra</li> <li>• Banaras Hindu University (BHU)</li> <li>• BARC, Mumbai.</li> <li>• BEL, Ghaziabad</li> <li>• Bidhan Chandra Krishi Vishwa Vidyalaya, Kalyani, West Bengal</li> <li>• C.C.S. University, Meerut</li> <li>• CDAC, Noida</li> </ul>	<ul style="list-style-type: none"> <li>• Central University of Haryana</li> <li>• Centre for Environmental Management of Degraded Ecosystems (CEMDE)</li> <li>• Centre for Policy Research and Centre for the Study of Developing Societies (CSDS), Delhi</li> <li>• Centre for Political Studies, JNU</li> <li>• Centre for Studies in Social Sciences, Calcutta</li> <li>• Centre for the Study of Developing Societies (CSDS), Delhi</li> <li>• Centre for Women Development Studies, Delhi</li> <li>• CFEES</li> <li>• CIFA, CIFRI and KIIT University</li> <li>• Council for Social Development (CSD), New Delhi</li> <li>• CSDS; Naz Foundation; O.P. Jindal University</li> <li>• Dabur Research Foundation</li> <li>• DAE-BRNS</li> <li>• DBT India</li> <li>• DEAL, DRDO, Dehradun</li> <li>• Delhi School of Economics</li> <li>• Delhi Technological University, Delhi, Central Institute of Fisheries Education, Rohtak, Haryana</li> <li>• Department of Crop Physiology, University of Agricultural Sciences, GKVK Campus, Bangalore.</li> </ul>



<ul style="list-style-type: none"> <li>• Department of Crop Physiology, University of Agricultural Sciences, GKVK Campus, Bangalore.</li> <li>• Department of English, North Eastern Hill University, Shillong</li> <li>• Department of Sociology, University of North Bengal</li> <li>• Department of Zoology, University of Lucknow</li> <li>• Department of Philosophy, Dev Samaj College for Women, Ferozpur City, Punjab.</li> <li>• Dept. of Social Exclusion, EFLU, Hyderabad</li> <li>• Directorate of Rice Research, Hyderabad, C</li> <li>• Dravid University, AP</li> <li>• DRDO</li> <li>• DST (India)</li> <li>• DST Japan Society for promotion of Science</li> <li>• DST-CSI</li> <li>• DST-SERB</li> <li>• DWSR Jabalpur</li> <li>• FSI and NCAOR, Goa</li> <li>• GBPISS, Allahabad; Ambedkar College, Nagpur</li> <li>• Goa University</li> <li>• Gujarat Central University</li> <li>• Guwahati University</li> <li>• Hindu College and Trade Union Member</li> <li>• Hunter College New York</li> <li>• Hyderabad Central University</li> <li>• IAEA</li> <li>• IARI, New Delhi</li> <li>• ICCR</li> <li>• ICMR &amp; Malaria Research Centre</li> <li>• ICSSR</li> <li>• IHBT, Palampur</li> <li>• ISJRP</li> <li>• ISJRP by DST</li> </ul>	<ul style="list-style-type: none"> <li>• IISc, Bangalore. Other institute</li> <li>• IISC., Bangalore, DRR &amp;</li> <li>• IISER Kolkata</li> <li>• IISER Mohali</li> <li>• IISER Pune</li> <li>• IIT Guwahati</li> <li>• IIT Kanpur</li> <li>• IIT, Delhi</li> <li>• IIT, Madras</li> <li>• IMSc Chennai</li> <li>• India International Centre and Sage Publications (India)</li> <li>• Indian Inst. of Natural Gums and Resins, Ranchi.</li> <li>• Indian Institute of Advanced Studies, Shimla; Dalit Camera</li> <li>• Indian Institute of Health Management Research (IIHMR), Jaipur</li> <li>• Indian Institute of Technology, Bombay</li> <li>• Indian Institute of Technology, Delhi</li> <li>• Indira Gandhi Krishi Viswavidyalaya Raipur.</li> <li>• Indo-Belarus Joint research project</li> <li>• Indo-Norwegian Cooperation Programme 2014 (INCP)</li> <li>• Indo-Taiwan S&amp;T Prog.</li> <li>• Indo-US Science &amp; Technology Forum</li> <li>• Institute for Research on India and International Studies (IRIIS)</li> <li>• Institute of Mathematical Science</li> <li>• Participatory Research in Agra (PRIA) in India</li> <li>• Patna University</li> <li>• Peoples Movement Against Nuclear Energy, Tamil Nadu</li> <li>• Peoples Union for Democratic Rights (PUDR), Delhi</li> <li>• Punjab Agricultural University, Ludhiana</li> <li>• Punjab University, Chandigarh</li> <li>• Rajiv Gandhi Centre for Biotechnology, Trivandrum, Kerala</li> <li>• Ram Manohar Lohiya Hospital</li> <li>• Ranchi University</li> </ul>
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<ul style="list-style-type: none"> <li>• ISSA DRDO, Delhi</li> <li>• IT-BHU</li> <li>• IUAC</li> <li>• Jadavpur University, Kolkata</li> <li>• Ambedkar University (AUD)</li> <li>• Jamia Millia Islamic University</li> <li>• Jammu University</li> <li>• Jawaharlal Nehru University (JNU)</li> <li>• LRDE, DRDO, Bangalore</li> <li>• Madhya Pradesh State Planning Commission</li> <li>• Madras Institute of Development Studies, Chennai</li> <li>• Madurai kamarajar University</li> <li>• Mahanirban Calcutta Research Group</li> <li>• Malaviya Center for Peace Research, Benaras</li> <li>• Manipal Centre for Philosophy and Humanities, Manipal</li> <li>• Maulana Azad Institute of Asian Studies, Kolkata (MAKAIS)</li> <li>• MoEF</li> <li>• Mycorrhizal Division, The Energy and Resource Institute, Delhi</li> <li>• Tehelka</li> <li>• The Energy and Resources Institute (TERI) University.</li> <li>• The Maharaja Sayajirao University of Baroda</li> <li>• The Netherland</li> <li>• TIFR, BARC, IMSc, HRI, Panjab U, BHU, SINP, etc.</li> <li>• TISS Mumbai</li> <li>• Transnational Institute, Amsterdam</li> </ul>	<ul style="list-style-type: none"> <li>• School of International Studies, Jawaharlal Nehru University</li> <li>• School of Liberal Studies, Ambedkar University</li> <li>• School of Management and Governance</li> <li>• Shyama Prasad Mookerjee College, Delhi University.</li> <li>• South Asian University</li> <li>• South Asian University</li> <li>• Sri Krishna Devaraya University</li> <li>• St. Aloysius College, Mangalore</li> <li>• SubeerMajumdar, NII, Delhi</li> <li>• Supreme Court of India</li> <li>• Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu.</li> <li>• Tata Institute of Social Sciences, India</li> <li>• NASA</li> <li>• National Bureau of Plant Genetic Resources, New Delhi</li> <li>• Institute of Physical Chemistry and Electrochemistry,</li> <li>• Institute of Physics, Bhubaneswar, IIT, Bhubaneswar</li> <li>• UCMS, University of Delhi</li> <li>• University Grants Commission</li> <li>• University of Agricultural Sciences, Raichur, Karnataka</li> <li>• University of Hyderabad (School of Life Sciences).</li> <li>• University of Lucknow</li> <li>• University of Pune</li> <li>• Water Technology Centre, IARI, New Delhi.</li> </ul>
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## ANNEXURE IX

### Collaboration with International Institutions for Research and Faculty exchange, Student exchange

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| <ul style="list-style-type: none"> <li>• Abai National Pedagogical University, Kazakhstan</li> <li>• AGRINATURA, Czech Republic</li> <li>• Alexandervon Humboldt</li> <li>• Allegheny College, USA</li> <li>• Literature and Sikh Studies, University of British Columbia, Vancouver,</li> <li>• University of Aarhus, Denmark,</li> <li>• Australian Catholic University, Melbourne</li> <li>• Bergh of Foundation, Berlin</li> <li>• Bhulan University, Bangladesh</li> <li>• Bielefeld University, Germany</li> <li>• Bogor Agricultural University (IPB Bogor), Indonesia</li> <li>• Brown University</li> <li>• Cambridge University</li> <li>• Carleton University</li> <li>• Catholic University of Leuven</li> <li>• Center for Refugee Studies</li> <li>• Central European University, Budapest</li> <li>• Centre for Applied Nonviolent Action and Strategies (CANVAS), Serbia</li> <li>• Centre for the Study of Global Ethics, University of Birmingham</li> <li>• COIMBRA Group, Belgium</li> <li>• Columbia University</li> <li>• Copenhagen University, Denmark</li> <li>• Department of Anthropology, London School of Economics, UK.</li> <li>• Department of Sociology, Faculty of Arts, University of Colombo, Sri Lanka</li> <li>• Department of Chemistry, IPN, Mexico City, Mexico</li> <li>• Institute for the International Affairs, Rome</li> <li>• JM, University Wurzburg, Germany</li> <li>• Just World Institute, University of Edinburgh</li> <li>• Kanda University of International Studies, Japan</li> <li>• Kathmandu University, Nepal</li> </ul> | <ul style="list-style-type: none"> <li>• Development Sociology and Director of Feminist, Gender and Sexuality Studies at Cornell University,</li> <li>• Drew University</li> <li>• Durham University</li> <li>• Edinburgh University</li> <li>• European Commission- Horizon 2020 -MARIE Sklodowska-CURIE</li> <li>• European Union</li> <li>• Faculty of Arts and Social Sciences, The University of Sydney, NSW.</li> <li>• Faculty of Law, University of Fribourg, Switzerland</li> <li>• Faculty of Law, University of Western Cape, South Africa</li> <li>• Faculty of Oriental Studies, Warsaw University, Poland.</li> <li>• Fellow, Transnational Institute, Amsterdam</li> <li>• Forum of Federations, Canada</li> <li>• Free University Berlin, Berlin, Germany</li> <li>• Frei University Berlin, Berlin, Germany</li> <li>• George Washington University, USA</li> <li>• Griffith University</li> <li>• Harvard Medical School, McLean Hospital, Belmont, MA 2478, USA</li> <li>• Heidelberg University</li> <li>• Helmholtz Centre for Environmental Research UFZ, Permoserstrae</li> <li>• History Department, Director of South Asian Studies, Middlebury College, Virginia, USA.</li> <li>• Humboldt Foundation, Germany</li> <li>• Hunter College City, University of New York, USA</li> <li>• Indo-Mexico Joint project, Department of Chemistry, IPN, Mexico City, Mexico</li> <li>• Stanford University, USA</li> <li>• The Leverhulme Trust</li> <li>• The Peace Research Institute of Oslo (PRIO)</li> <li>• The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), The Philippines</li> <li>• Tribhuvan University, Nepal</li> <li>• Universidad San Francisco de Quito in Ecuador</li> </ul> |
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<ul style="list-style-type: none"> <li>• Kings College, London</li> <li>• KU Leuven, Belgium</li> <li>• Lahore University of Management Sciences, Pakistan</li> <li>• Laussane University, Switzerland</li> <li>• Leibniz University of Hannover</li> <li>• Louisiana State University, USA</li> <li>• Lund University</li> <li>• Macmillan Global Justice Programme, Yale University;</li> <li>• Centre for Study of Global Ethics, University of Birmingham</li> <li>• Masaryk University, Czech Republic</li> <li>• Max Planck Institute, Gottingen</li> <li>• Murdoch University, Australia</li> <li>• Nanjing University, PR China</li> <li>• Nanopartica Gm BH</li> <li>• Newcastle University, UK</li> <li>• NOW Netherlands</li> <li>• Penn University, USA</li> <li>• Politecnico di Torino, Italy</li> <li>• Potsdam University, Germany</li> <li>• RFBR (Russia)</li> <li>• Royal University of Bhutan, Bhuta</li> <li>• University of Montpellier III</li> <li>• University of Montreal, Canada</li> <li>• University of Naples II</li> <li>• University of Navarra</li> <li>• University of North Carolina</li> <li>• University of Nottingham</li> <li>• University of Peradeniya, Sri Lanka; Kasetsart University, Thailand</li> <li>• University of Science and Technology of China, PR China</li> <li>• University of Tokyo</li> <li>• University of Turin, Turin, Italy</li> <li>• University of Turku, Finland</li> <li>• University of Warsaw</li> <li>• University of Wisconsin-Madison and London School of Economics and Political Science</li> </ul>	<ul style="list-style-type: none"> <li>• Universidad Santiago de Compostela</li> <li>• Universidade de Braslia, Brazil.</li> <li>• University of St. Andrews, Edinburgh.</li> <li>• University of Australia</li> <li>• University of Birmingham</li> <li>• University of Bonn, Germany</li> <li>• University of Bristol</li> <li>• University of British Columbia, Canada</li> <li>• University of Burdwan</li> <li>• University of California, Berkley, USA.</li> <li>• University of California, San Diego</li> <li>• University of California, Santa Barbara</li> <li>• University of Chittagong, Bangladesh</li> <li>• University of Duisburg, Essen, Germany</li> <li>• University of Edinburgh</li> <li>• University of Göttingen - Georg-August-Universität Göttingen</li> <li>• University of Heidelberg</li> <li>• University of Leeds, UK</li> <li>• University of Manchester, Manchester</li> <li>• University of Mary, Washington DC</li> <li>• University of Maryland</li> <li>• University of Melbourne</li> <li>• University of Missouri</li> <li>• University of Wuppertal, Germany</li> <li>• University of Wuppertal, Germany</li> <li>• Uppsala University, Sweden</li> <li>• Uppsala University, Sweden</li> <li>• Vanderbilt University</li> <li>• Vietnam Academy of Social Sciences</li> <li>• Visayas State University, The Philippines</li> <li>• Wales DTC, UK</li> <li>• World International Studies Committee (WISC) at University of Gothe, Germany</li> <li>• Yale University</li> </ul>
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