

**SHOOLINI
UNIVERSITY
SOLAN, HP**

SELF STUDY REPORT



PART-II Evaluative Report of the Schools - June 2015

Submitted to
National Assessment & Accreditation Council (NAAC)
For Assessment & Accreditation

INTRODUCTION

Shoolini University is a leader in the field of academics and has made giant strides towards delivering quality education and research with a focus on Himalayan sustainability. The University is approved by the UGC under 2f and is also having certification by ISO 9001:2008 for education and research work in the field of Biosciences, Engineering, Management and other subjects and fields.

The Shoolini University encompasses following five Faculties and nine Schools:

1. Faculty of Applied Sciences and Biotechnology
 - I. School of Biotechnology
 - II. School of Bioengineering and Food Technology
2. Faculty of Basic Sciences
 - I. School of Biological and Environmental Sciences
 - II. School of Chemistry
 - III. School of Physics and Materials Science
3. Faculty of Management Sciences and Liberal Arts
 - I. School of Business Management and Liberal Arts
4. Faculty of Pharmaceutical Sciences
 - I. School of Pharmaceutical Sciences
5. Faculty of Engineering and Technology
 - I. School of Mechanical and Civil Engineering
 - II. School of Electrical and Computer Science Engineering

Each Faculty is headed by the Dean who is senior most Professor in the concerned faculty. The Schools are headed by the Head of the School. This volume contains the Self Study Reports of all the Schools listed within each Faculty.

The detailed School wise information as per the proforma of NAAC is appended in this report.

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1. Evaluative Report of School of Biotechnology

The School of Biotechnology is part of the Faculty of Applied Sciences and Biotechnology, which also has a School of Bioengineering and Food Technology; both schools being interdependent for Academic and Research programs.

Since 2012, the School has been ranked 2nd among the private biotechnology institutions of India by BioSpectrum survey. The University was also acknowledged for its excellent research in Biotechnology Sciences by CCI & Gujarat Technological University. The School has well qualified and learned faculty members encompassing Post-Docs from various institutions in USA and Europe. The School provides an outcome driven curriculum and innovative teaching and learning methods including online learning system (e-Univ). As a value addition to the education, SPRINT program has been adopted for skill and personality development of the students. The curricula are designed and revised in consultation with industry to meet the growing demand of R&D industry and Institutes.

Aligned with the University research thrust areas, the School focuses on harnessing Himalayan biodiversity. The key areas of research include conservation of Himalayan biodiversity, drug discovery, microbial diversity, agricultural research, etiology of human diseases, and diagnostics. Within a short span of five years, 20 students have completed their Ph.Ds. The School has generated research grants more than rupees four crores from DST, LSRB, DBT and ICMR. More than 70 research papers have been published in the journals of national and international repute with the highest impact factor of 15 and average h-index of 4. The School has filed seven patents in translational research of international importance. Moreover, the School has established a repository of micro and macro flora from the Western Himalayas with a vision to preserve and utilize their potential in the future.

1. Name of the Department/School: School of Biotechnology

2. Year of establishment: 2009

3. Is the Department/School part of a Faculty of the University?

Yes, School of Biotechnology is part of Faculty of Applied Sciences and Biotechnology.

4. Names of Programs offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc. D.Litt., etc.):

School of Biotechnology offers Biotechnology and Microbiology programs from undergraduate to Ph.D. level. All programs offered have research as a key

component in the curriculum. The courses offered by School of Biotechnology are listed below.

- B.Sc. (Hons) Biotechnology
- B.Sc. (Hons) Microbiology
- M.Sc. Biotechnology
- M.Sc. Microbiology
- M.Sc. Biochemistry
- M.Tech. Dual Degree in Biotechnology
- M.Tech. Biotechnology
- M.Phil. Biotechnology
- M.Phil. Microbiology
- Ph.D. Biotechnology
- Ph.D. Microbiology

5. Interdisciplinary Programs and departments involved:

The School of Biotechnology offers joint programs with other Schools of the University. The list of programs is given below:

Table BT01: List of Programs offered in School of Biotechnology in collaboration with other Schools

S.No	Programs	School
1	B.Sc. (Biotechnology)	School of Chemistry School of Biological and Environmental Sciences
2	B.Sc. (Microbiology)	School of Chemistry School of Biological and Environmental Sciences
3	M.Sc. (Biotechnology)	School of Biological and Environmental Sciences
4	M.Sc. (Microbiology)	School of Biological and Environmental Sciences
5	M.Phil./Ph.D. (Biotechnology)	School of Pharmaceutical Sciences School of Business Management & Liberal Arts School of Electrical and Computer Engineering
6	M.Phil./Ph.D. (Microbiology)	School of Pharmaceutical Sciences School of Business Management and Liberal Arts School of Electrical and Computer Engineering

6. Courses in collaboration with other universities, industries, foreign institutions, etc.: Nil

At present there are no such programs offered by the School of Biotechnology. However, the School intends to enhance collaboration with other Universities, Industries and Foreign institutions for the development of joint courses.

7. Details of Programs discontinued, if any, with reasons:

M.Sc. (Biochemistry) program was discontinued from 2014-15, because the number of students joining the program were less than five. This was done in accordance with the directions of H.P. Private Educational Institutions Regulatory Commission (HP-PERC).

8. Examination System: Annual/Semester/Trimester/Choice Based Credit System:

Semester system followed till June 2015. As per the UGC guidelines, Choice Based Credit System (CBCS) has been adopted from 2015-2016.

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

The School of Biotechnology follows an interdisciplinary approach and actively participates in faculty exchange and delivery of course curriculum across the faculties. School of Biotechnology has strong linkages with School of Bioengineering and Food Technology (SBFT), so faculty members of Biotechnology are actively involved in the courses offered by SBFT. Following is the list of courses taken by the members of the School of Biotechnology:

Table BT02: Participation of School of Biotechnology in courses offered by other Schools

S.No	Course	Program	Name of the School
1.	Biochemistry	B. Pharmacy	School of Pharmaceutical Sciences
2.	Industrial Biotechnology	MBA (specialization in Biotechnology)	School of Management Sciences and Liberal Arts
3.	Research Methodology and Instrumentation; Advances in Genetic Engineering; Enzymology	B.Sc., M.Phil., Ph.D.	School of Biological and Environmental Sciences
4.	Immunology, Protein Engineering, Instrumentation, Genetic Engineering, Molecular Biology, Enzymology, Stem Cells and Health Care, Major project, Minor Project etc	B.Tech. (Biotechnology/ Food Technology)	School of Bioengineering and Food Technology

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

Following is the list of teaching faculty in the School of Biotechnology

Table BT03: Number of teaching posts in the School of Biotechnology

Teaching Post	Sanctioned	Filled	Actual (including CAS & MOS)
Professors	3	3	
Associate Professors	4	3	
Assistant Professors	8	5	
Others	-	-	

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

Details of teaching faculty in the School of Biotechnology and list of faculty members from other Schools that are teaching courses in School of Biotechnology have been given below:

Table BT04: List of faculty members of School of Biotechnology

Name	Qualification	Designation	Specialization	Years of experience	Ph.D/M.Phil students guided for the last 4 yrs*
Prof. D.R. Sharma	Ph.D.	Prof. of Eminence	Plant Biotechnology	40	5/8
Prof. P.C. Sharma	Ph.D.	Professor	Microbial Biotechnology, Pathogenic viruses	30	5/ 5
Dr Anuradha Sourirajan	Ph.D.	Professor	Cell Cycle and Cancer Biology, Stress Control	11	3/2
Dr Kamal Dev	Ph.D.	Associate Professor	Translational Control, Extremophiles Enzymology	11	4/5
Dr Umar Farooq	Ph.D.	Associate Professor	Parasitology, immunology	12	5/10
Dr Saurabh Kulshrestha	Ph.D.	Associate Professor	Molecular Plant Microbe Interaction	9	3/4
Dr Reena Vohra Saini	Ph.D.	Assistant Professor	Animal Biotechnology, Cancer Biology	6	Nil
Dr Astha Tripathi	Ph.D.	Assistant Professor	Mycoremediation and Mycology	4	Nil/11
Dr.Savita Jandaik	Ph.D.	Assistant Professor	Mycology	10	1/ 2
Dr Sheetal Mehta	Ph.D.	Assistant Professor	Microbiology	4	Nil
Mr Ashwani Kumar	Ph.D. viva awaited	Assistant Professor	Microbiology	1	Nil

*Number includes candidates whose thesis have been submitted

Table BT05: List of faculty members of other Schools involved in teaching in the School of Biotechnology

S. No	Name
1	Ms. Poonam Nanda, Associate Professor, School of Electrical and Computer Science Engineering
2	Dr. Rakesh Shukla, Assistant Professor, School of Business Management and Liberal Arts
3	Dr. Gaurav Sharma, Assistant Professor, School of Chemistry
4	Dr. Amit Kumar, Assistant Professor, School of Chemistry

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

The School utilizes the expertise of senior and renowned people in their respective fields by conducting special lectures and discussions with students and faculty members. Following is the list of renowned scientists and academicians inducted in the School as Professor of Eminence and Adjunct Faculty:

Table BT06: List of Professor of Eminence and Adjunct Faculty in School of Biotechnology

S.No	Name	Affiliation
1	Prof. R. C. Mahajan, Professor of Eminence	Ex Professor, PGIMER, Chandigarh Ex President INSA.
2	Dr Manoj Kashyap, Adjunct Professor	Moore's Cancer Center, University of California, USA.

13. Percentage of classes taken by temporary faculty – Program-wise information: Nil

14. Program-wise Student Teacher Ratio

Table BT07: List of current student teacher ratio in the School of Biotechnology

Under Graduate Programs	Student Teacher Ratio
B.Sc.	22.6:1
M.Sc.	9.2:1
M.Tech.	9.6:1

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

Table BT08: List of academic and support staff in the School of Biotechnology

Staff	Sanctioned	Filled	Actual
Number of Technical staff	1	Nil	Nil
Number of Lab Attendants	8	8	8
Number of administrative staff	1	1	1

16. Research thrust areas as recognized by major funding agencies

Research philosophy of the School of Biotechnology focuses on developing products of industrial and societal relevance through systematic exploration of Himalayan Biodiversity. School of Biotechnology also strives to provide solutions to problems of local (Himalayan) relevance in the areas of Agriculture, Health, Food and Environment. The same has been endorsed by various funding agencies of Govt. of India. Following are the list of specific areas in which funding has been received by the School:

Drug discovery

- Targeting cell cycle kinases and modulating immune response for Cancer Therapy.
- Identification of bioactive molecules (antimicrobial, anticancer, immunomodulators) from medicinal plants and mushrooms of Western Himalayas.

Microbial biodiversity

- Genomics, proteomics, and enzyme mining from extremophilic (thermophiles, psychrophiles, and halophiles) microorganisms of Himachal Pradesh.

Agricultural research

- Host pathogen interaction
- Generation of mycovirus based biocontrol strategy for the control of fungal pathogens.
- Molecular tools for engineering desiccation and salinity tolerance in crop plants.

Conservation of himalayan biodiversity

- Conservation, characterization and micro-propagation of economically important and endangered medicinal plant species of Western Himalayas.

Etiology of human diseases

- Molecular epidemiology of common diseases, like malaria, Leishmaniasis, Typhoid etc

Diagnostics

- Molecular mechanism, genetic relatedness, and diagnostics of various pathogens i.e. bacteria, viruses, fungi and parasites infecting humans and animals.
- Development of diagnostics and nanopeptide based vaccines for Malaria

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

The School of Biotechnology is actively engaged in predefined thrust areas of research of the University. Within a short span of 5 years, most of the faculty members have their own externally funded research projects. In addition, a number of research projects have been granted to students to pursue Ph.D.

a) National

Number of faculty members with ongoing projects: 06

Name of faculty members: Dr. Umar Farooq, Dr. Anuradha Sourirajan, Dr. Saurabh Kulshrestha, Dr. Astha Tripathi, Dr. Reena Vohra Saini, Dr Savita Jandaik

b) International funding agencies: Nil**c) List of research projects sanctioned and grants received**

Table BT9: List of research projects sanctioned and grants received by the faculty members in School of Biotechnology:

Year	PIs	Name of the Project	Name of Funding Agency	Total Grant Received (in lakhs)
2009-2012	Dr. Savita Jandaik	Studies on genetic variability in <i>Ganoderma lucidum</i> to study elite strain for commercial purposes	DST	14.0
2011-15	Dr. Anuradha Sourirajan	Identification of substrates for <i>S. cerevisiae</i> Polo- like kinase (PLK), Cdc5 during meiotic cell division.	DBT	45.47
2012-15	Dr. Umar Farooq	Prevalence and Characterization of <i>Echinococcus granulosus</i> strains isolated in Himachal Pradesh	ICMR	35.0

Year	PIs	Name of the Project	Name of Funding Agency	Total Grant Received (in lakhs)
2012-15	Dr. Anuradha Sourirajan Co-PI: Dr. Kamal Dev	Identification and Characterization of Medicinal Plants of North-West Himalayas with Synergistic Effects on Traditional Antibiotics to Control Clinical Bacterial Infections.	SERB/DST	22.7
2012-15	Dr. Saurabh Kulshrestha	Identification of genes involved in pathogenesis of <i>Rosellinia necatrix</i> causing white root rot on apple	DST	23.0
2014-17	Dr. Saurabh Kulshrestha	Identification and characterization of hypovirulence factors from <i>Rosellinia nectarix</i> causing white root rot in apple.	DBT	28.7
2014-17	Dr. Astha Tripathi (PI), Dr Saurabh Kulshrestha (Co-PI)	Isolation and identification of bioactive compounds from wild mushrooms for new drug discovery	DBT	16.0
Approved	Dr. Umar Farooq	Role of Th17 and Treg Cells in Pathogenicity and immunity of <i>P. falciparum</i> infection	ICMR	80.0
Approved	Dr. Reena Saini (PI) & Dr. Neeraj Mahindroo (CO-PI)	Evaluation of withanolide lactones as immunomodulators to induce granulysin expression in immune cells conferring cytotoxicity towards cancerous cells	DBT	25.0
Approved	Dr Astha Tripathi	Cultivation of wild edible mushrooms with functional properties of performance enhance	LSRB	20.0
			TOTAL	309.87

Table BT10: List of Student projects sanctioned by various funding agencies

Year	PIs	Name of the Project	Name of Funding Agency	Grant Received
2010-2015	Ms. Varsha Rani under the supervision of Dr Kamal Dev	Characterization of beta-galactosidase from thermophilic bacteria.	DST(INSPIRE)	17.0 Lakhs
2010-2015	Mr. Jitender Kumar under the supervision of Dr D. R. Sharma	In vitro culture standardization of <i>Podophyllum hexandrum</i> for production of Podophyllotoxin.	UGC –RGNF	17.0 Lakhs
2011-2016	Ms. Nazam Khan under the supervision of Dr Umar Farooq	Identification and characterization of promiscuous peptides from vaccine candidate antigen of <i>P. falciparum</i> by using <i>In silico</i> approach.	UGC –MANF	17.0 Lakhs
2014-2018	Ms. Tanvi Gupta under the supervision of Dr Saurabh Kulshrestha	Identification and characterization of mycoviruses capable of inducing hypovirulence in isolates of <i>Sclerotinia sclerotiorum</i>	DST(INSPIRE)	17.0 Lakhs
2014-2018	Ms. Neha under the supervision of Dr Umar Farooq	Role of Th-17 and T-regulatory cells in pathogenesis and immunity in <i>Salmonella typhi</i> infection	DST(INSPIRE)	17.0 Lakhs
2012-2016	Ms. Poonam Kumar under the supervision of Dr Savita Jandaik	Isolation characterization, immobilization and application of an alkaliphilic thermotolerant protease	UGC –RGNF	17.0
2013-2017	Ms. Bharti under the supervision of Dr P.C. Sharma	Phenotypic and genotypic characterizations of Extended spectrum beta lactamase (ESBL) producing MDR isolates of pseudomonas aeruginosa from clinical case in Himachal Pradesh	UGC –RGNF	17.0
			TOTAL	119.0 Lakhs

Total Grant Received: Rs 428.87 lakhs

18. Inter-institutional collaborative projects and associated grants received

Shoolini University facilitates inter-institutional collaborations at national and international level for research. The School is able to obtain one research project having multi institutional national collaboration. A number of other collaborations are being pursued for funding.

a) National collaboration: 1

Table BT11: Details of Inter institutional research project

S. No.	Project Title	Funding Agency	PI	Co-PI	Grant amount
1	Role of Th-17 and T-regulatory cells in pathogenesis and immunity in <i>Plasmodium falciparum</i> infection	ICMR	1. Dr. Umar Farooq, M.Sc., Ph.D, Associate Professor, Microbiology, Shoolini University, Solan, HP 2. Dr. R. Sehgal, M.D., Professor, Deptt. Of Parasitology, PGIMER, Chandigarh 3. Dr. J. Mahanta, MD, Director Regional Medical Research Centre (ICMR) Dibrugarh, Assam.	1. Dr. R.C. Mahajan, MD. Emeritus Professor, Dept. of Parasitology, PGIMER, Chandigarh 2. Dr. P. K. Mohapatra, M.D. Deputy Director/Scientist F Regional Medical Research Centre (ICMR) Dibrugarh, Assam.	80.0 Lakh

b) International collaboration Nil

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

The School of Biotechnology has applied for DST-FIST grant for Rs. 3 crores

20. Research facility / centre with

State recognition: Nil

National recognition: Nil

Microbial repository of North-western Himalayas (Proposed)

International recognition: Research Center in Biomics in collaboration with Sierra Biolife, Australia

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

22. Publications:

Research being a focal theme of School of Biotechnology, School has published in the journals of national and international repute.

Number of papers published in peer reviewed journals (national / international): 72

Monographs: Nil

Chapters in books: Nil

Edited Books: Nil

Books with ISBN with details of publishers: Nil

Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.): 35

Citation Index – range /average: 0-15/1

SNIP:

SJR:

Impact Factor – range average: 0- 15 /11

h-index: 4

Detail List of Publications:

1. Ali R, Chauhan V, Farooq S, Khan A and Farooq U. *In-Vitro* Analysis of Antibacterial Activity of *Ocimum sanctum* against Pathogenic Bacteria and Quantification of Ursolic Acid and Oleanolic Acid. *International Journal of Pharmaceutical Science Review and Research* 2014, 25(2): 13-17.

2. Bains A and Tripathi A. Antibacterial activity of wild mushrooms against pathogenic bacteria. *Journal of Pharmacology* (Under revision)
3. Batta B, Katoch A, Bhatia VK, Patil S and Sharma PC. Screening of leaf extracts of *Azadirachta indica* (Neem), *Aegle marmelos* (Bael) and *Trigonella foenumgraecum* (Methi) for their inhibitory activity on the strains of *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Candida* species. *International Journal of Pharmaceutical Sciences Review and Research* 2013, 19(2): 42-46.
4. Bharti, Minhas N, Patil S, Kumar A and Sharma PC Novel preparations of culture media from plant materials for cultivation of *Candida albicans*. *International Journal of Pharmaceutical Sciences Review and Research* 2013, 20(1): 128-133
5. Chaudhary R and Tripathi A. Molecular profiling and bioactive properties of six wild mushrooms collected from Himachal Pradesh. *Journal of Applied Microbiology*. (Under Revision)
6. Chaudhary R. and Tripathi A. (2015) Isolation and identification of bioactive compounds by *Irpex lacteus*. *Journal of Pharmaceutical Research Science* (Accepted).
7. Chauhan R and Sharma PC Phenotypic detection of Metallo-B-lactamase(MBL) producers among multidrug resistant(MDR)strains of *P. aeruginosa* in Himachal Pradesh. *Indian Journal of Basic and Applied Medical Research* 2015, 3(1):303-313
8. Chauhan S, Farooq U, Singh V and Kumar A. Determination of prevalence and antibacterial activity of ESBL (extended spectrum beta-lactamases) producing *Klebsiella* Species isolated from raw milk of doon valley in India. *International Journal of Pharma and Bio Sciences* 2013, 4(1): 417 – 423.
9. Clayberger C, Finn MW, Wang T, Saini RV, Wilson C, Barr VA, Sabatino M, Castiello L, Stroncek D and Krensky AM. 15 kDa granulysin causes differentiation of monocytes to dendritic cells but lacks cytotoxic activity. *Journal of Immunology* 2012, 188:6119-6126.
10. De Muyt A, Jessop L, Kolar E, Sourirajan A, Chen J, Dayani Y, and Lichten M. BLM helicase ortholog Sgs1 is a central regulator of meiotic recombination intermediate metabolism. *Molecular Cell* 2012, 46: 43-53.
11. Dev K, Qui H, Dong J, Zhang F, Barthlme D and Hinnebusch AG. The β /Gcd7 Subunit of Eukaryotic Translation Initiation Factor 2B

- (eIF2B), a Guanine Nucleotide Exchange Factor, Is Crucial for Binding eIF2 *In Vivo*. ***Molecular and Cellular Biology*** 2010, 30 (21), 5218-5233. *Spotlight article in the same issue: Double Duty for an Essential Subunit of Eukaryotic Translation Initiation Factor 2B.*
12. Farooq U, Dubey ML, Shrivastwa SK and Mahajan RC. Genetic polymorphism of *Plasmodium falciparum*: Differentiation of parasite isolates of high and low virulence by RAPD. ***Indian Journal of Medical Research*** 2012, 136: 292-295.
 13. Gupta S, Sharma P, Dev K, Srivastava M, and Sourirajan A. A diverse group of halophilic bacteria exist in Lunsu, a natural salt water body of Himachal Pradesh, India. ***SpringerPlus*** 2015, (accepted)
 14. Jandaik S, Kumar V and Thakur P. *Vermiwash: Plant growth enhancer and antifungal agent*. ***International Journal of Extensive Research*** 2015, 2:38-41.
 15. Jandaik S, Sharma M, Jitender, and Singh S. Antimicrobial activity of bacteriocin produced by lactic acid bacteria isolated from milk products. ***Journal of Pure and Applied Microbiology*** 2012, 7(1): 603-608.
 16. Jandaik S, Singh R and Sharma M. Comparative growth characteristics and yield attributes of Lingzhi or Reishi Medicinal Mushroom, *Ganoderma lucidum* (Higher basidiomycetes) on different substrates in India. ***International Journal of Medicinal Mushroom*** 2013, 15(5): 497-503
 17. Joshi H, Gururaja MP and Singh S. *Memecylon umbellatum*: A Review. ***Journal of Pharmacy Research*** 2011, 11(2): 54-58
 18. Kapoor S, Sharma DR and Sharma S. Supervising commodious exposed therapeutic plant *Inula Racemosa* by *in vitro* callus induction. ***Indian Journal of Scholarly Research*** 2013, 2(4): 49
 19. Katoch A, Batta B, Kumar A and Sharma PC. Screening of *Murraya koenigii* (Curry) and *Camellia sinensis* (Tea) leaves for antimicrobial activity against strains of *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Candida* species and their phytochemical analysis. ***International Journal of Pharmaceutical Sciences and Research*** 2013, 4(2): 862-868
 20. Kaur N, Farooq U, Rana T, and Singh S. Multidrug resistance in *P. aeruginosa* : In vitro efficacy of current chemotherapy against clinical isolates from Northarn India. ***International Journal of Biology, Pharmacy and Allied Sciences*** 2015, (In Press)
 21. Kaushal S, Gupta A and Saini RV. Immunomodulatory activity of

- in vitro* propagated tissues of *Gentiana kuroo* Royle. **International Journal of Biology, Pharmacy and Allied Sciences** 2015, (Accepted).
22. Kaushal S, Sidana A, and Dev K. In vitro plant production through apical meristem culture of *Gentiana kurroo* Royle. **Journal of Medicinal Plants Studies** 2014, 3(1): 04-09
 23. Khan N, Kumar A, Sharma V, Khan A and Farooq U. Ghaggar River: Impact of polluting agents. **International Journal of Pharmaceutical Sciences Review and Research** 2014, 24(2): 171-175.
 24. Khatri I, Kaur S, Devi U, Kumar N, Sharma D, Subramanian S and Saini AK. Draft Genome Sequence of Plant Growth-Promoting Rhizobacterium *Pantoea* sp. Strain AS-PWVM4. **Genome Announcement** 2013, 1. pii: e00947-13. doi: 10.1128/genome.A.00947-13.
 25. Kulshrestha S and Sharma M. *Colletotrichum gloeosporioides*: An anthracnose causing pathogen of fruits and vegetables. **Biosciences, Biotechnology Research Asia** 2015, (Accepted).
 26. Kulshrestha S, Hallan V, Sharma A, Seth CA, Chauhan A and Zaidi AA. Molecular characterization and intermolecular interaction of coat protein of *Prunus necrotic ringspot virus*-implications for virus assembly. **Indian Journal of Virology** 2013, 24(2): 235-241.
 27. Kulshrestha S, Seth CA, Sharma M, Sharma A, Mahajan R and Chauhan A. Biology and control of *Rosellinia necatrix* causing white root rot disease: A review. **Journal of Pure and Applied Microbiology** 2014, 8(3): 1803-1814.
 28. Kulshrestha S, Sharma A and Seth CA. Molecular biology of *Tomato spotted wilt virus* – an update. **Journal of Applied Horticulture** 2013, 15(2): 71-80.
 29. Kumar A, Dev K, and Sourirajan A. Screening of medicinal and aromatic plants of Himachal Pradesh for antiproliferative activities against budding yeast *Saccharomyces cerevisiae*. **International Journal of Pharma and Bio Sciences** 2015, 6(3): (B) 280 – 288.
 30. Kumar A and Sharma PC. In vitro studies on selective virulence traits of fluconazole resistant and species of *Candida* isolated from clinical cases. **International Journal of Biological and Pharmaceutical Research** 2013, 4(10): 685-696.
 31. Kumar A, Kumar A, Sharma K, Patil S, Chauhan V, Pratush A and Sharma PC. Smear and Culture examination of clinical sample from suspected patient for *Mycobacterium tuberculosis*. **International**

- Journal of Pharmaceutical Sciences Review and Research* 2012, 2:83-85.
32. Kumar A, Sharma PC, Kumar A and Negi V. A Study on phenotypic traits of *Candida* species isolated from blood stream infections and their in vitro susceptibility to fluconazole. *Al-Ameen Journal of Medical Sciences Research* 2014, 7(1):83-91
 33. Kumar A, Singh S and Kumar D. Evaluation of antimicrobial potential of cadmium sulphide nanoparticles against bacterial pathogens. *International Journal of Pharmaceutical Sciences Review and Research* 2014, 24(2):202-206.
 34. Kumar J, Dev K and Kumar A. Quantification of Podophyllotoxin From *Podophyllum hexandrum* Using HPLC-UV/DAD. *Journal of Tree Sciences* 2014, 33 (2): 33-37.
 35. Kumar T, Sourirajan S and Dev K. Isolation and characterization of psychrotolerant *Serratia quinivorans* secreting β -galactosidase. *Universal Journal of Microbiology Research* 2015, 3(1): 1-9.
 36. Kumari P, Jandaik S and Batta S. A thermotolerant protease from *Bacillus* sp- isolation, characterization, optimization and purification. *Journal of Pure and Applied Microbiology* 2014, 8(5): 3667-3674
 37. Mehta P, Walia A, Chauhan A, Kulshrestha S and Shirkot CK. Phosphate solubilization and plant growth promoting potential by stress tolerant *Bacillus* sp. isolated from rhizosphere of apple orchards in trans Himalayan region of Himachal Pradesh. *Annals of Applied Biology* 2013, 163: 430-443.
 38. Mehta P, Walia A, Kulshrestha S, Chauhan A and Shirkot CK. Efficiency of plant growth promoting P-solubilizing *Bacillus circulans* CB7 for enhancement of tomato growth under net house condition. *Journal of Basic Microbiology* 2014, 53 (DOI 10.1002/jobm.201300562).
 39. Mehta S and Jandaik S. In vitro comparative evaluation of antibacterial activity of fruiting body and mycelial extracts of *Ganoderma lucidum* against pathogenic bacteria. *Journal of Pure and Applied Microbiology* 2013, 6(4): 1997 -2001
 40. Mehta S, Jandaik S and Gupta D Effect of cost-effective substrates on growth cycle and yield of Lingzhi or Reishi medicinal mushroom, *Ganoderma lucidum* (Higher Basidiomycetes) from North western Himalaya (India). *International Journal of Medicinal Mushrooms* 2014, 16(6): 585–591
 41. Neha, Chauhan S, Sharma Y, Tagore S, Alam A and Farooq U. Screening of medicinal plants for antityphoidal activity against

- multidrug resistance *Salmonella typhi*. **Universities' Journal of Phytochemistry and Ayurvedic Heights** 2014, 2 (17):68-72.
42. Pant N, Sharma PC, Jatana M, Singh S, Patil S and Kumar A. A novel modification of culture media for cultivation of *Cryptococcus neoformans* by using extracts of different plants from Solan area of Himachal Pradesh (India). **Elixir Bio Tech.** **2012**, 45:7876- 7880
 43. Pathania K, Singh S and Joshi H. Synergistic activity of plants with standard antibiotics against MDR strains. **World Journal of Science and Technology** 2013, 3(2): 26-29
 44. Patil S, Kumar D and Sharma PC. Emergence of methicillin resistant *Staphylococcus aureus* strains (MRSA) and Multidrug resistant (MDR) strains in Himachal Pradesh. **International Journal of Pharmaceutical Sciences Review and Research** 2013, 23(1): 1-15.
 45. Patil S and Sharma PC. Bacteriophage typing and plasmid profiling of Methicillin resistant *Staphylococcus aureus* strains isolated from human clinical cases in Himachal Pradesh. **Asian journal of plant science and Research** 2013, 3(4):866-869
 46. Rana T, Singh S, Kaur N, Pathania K and Farooq U. A review on efflux pump inhibitors of medically important bacteria from plant sources. **International Journal of Pharmaceutical Sciences Review and Research** 2014, 26(2):101-111.
 47. Saini AK, Chauhan PK, Singh V and Sharma P. Phytochemical, antioxidant & in vitro antibacterial activity of aqueous & ethanolic fruit extracts of *Kigelia Africana*. **Indian Journal of Pharmaceutical and Biological Research** 2013, 1(2):46-52
 48. Saini RV, Wilson C, Finn MW, Wang T, Krensky AM and Clayberger C. Granulysin delivered by cytotoxic cells damages endoplasmic reticulum and activates caspase-7 in target cells. **Journal of Immunology** **2011**, 186:3497-3504.
 49. Sankhyani N, Sharma A, Seth CA, Chauhan A and Kulshrestha S. Determination and comparison of Vitamin C content from *Moringa oleifera* by different methods. **International Journal of Agriculture Science and Research** 2013, 3(2): 67-70.
 50. Sharma A and Kulshrestha S. First report of *Amaranthus* sp. as a natural host of Capsicum chlorosis virus in India. **VirusDisease** **2014**, 25(3): 412-413.
 51. Sharma A, Khan MA and Farooq U. Screening of Different Varieties of *Mangifera indica* for antimicrobial activity. **Universities' Journal of Phytochemistry and Ayurvedic Heights** 2014, 1 (16); 12-19.

52. Sharma B, Verma R, Dev K and Thakur R. Molecular characterization of Manikaran hot spring microbial community by 16S rRNA and RAPD analysis. ***Biotechnology An Indian Journal***. 2012, 6: 254-266
53. Sharma D, Bhatia VK, Patil S and Sharma PC. Antimicrobial activity of selected Cryptogams from Solan region. ***International Journal of Biological & Pharmaceutical Research*** 2013, 4(6): 448-454
54. Sharma N, Bains A and Singh S. Phenotypic and Genotypic Characterization of MDR Isolates of *Staphylococcus aureus* from Blood and Pus in Himachal Pradesh. ***International Research Journal of Pharmacy*** 2012, 3 (8): 218-222
55. Sharma N, Jandaik S, Kumar S, Chitkara M and Sandhu IS. Synthesis, characterisation and antimicrobial activity of manganese- and iron-doped zinc oxide nanoparticles. ***Journal of Experimental Nanoscience***, 2015, DOI: 10.1080/17458080.2015.1025302
56. Sharma N, Singh S and Bains A. Phenotypic and Genotypic Characterization of MDR Isolates Of *Staphylococcus aureus* from Urine and Sputum in Himachal Pradesh. ***Drug Invention Today*** 2012, 4(10): 497-500
57. Sharma P, Sharma PC, Patil S, Sen R and Kumar A. In-vitro evaluation of antibacterial activity of extracts from *Parmelia* and *Dermatocarpon spp.* of lichen against MDR clinical isolates of *Staphylococcus aureus* and *Escherichia coli*. ***Advances in Pharmacology and Toxicology*** 2012, 13:15-21
58. Sharma V, Sharma HV, Mehta D, Chhabra B, Thakur D, Sourirajan A and Dev K. Comparative analysis of antibacterial and antifungal properties of traditional medicinal plants of Shimla and Solan, Himachal Pradesh. ***International Journal of Pharmacognosy and Phytochemical Research*** 2014, 6: 18-26.
59. Sidana A and Farooq U. Isolation and Biotransformation and evaluation of antibacterial activity of embelin from *Embolin ribesi*. ***Universities' Journal of Phytochemistry and Ayurvedic Heights*** 2012, 2 (13): 5-9.
60. Sidana A and Farooq U. Sugercane Bagasse: A potential medium for fungal culture. ***Chinese J Biology*** 2014, doi:10.1155/ 2014/ 840505.
61. Sidana A and Farooq U. Evaluation of antileishmanial activity of plants used in Indian traditional medicine. ***Bangladesh Journal of Pharmacology*** 2015, 10:423-426.

62. Sidana A, Alam A and Farooq U. Netamycin and nystatin: Two novel inhibitors of *leishmania donovani* essential enzymes. ***IJBPAS* 2015**, (In Press)
63. Singh S and Joshi H. *Diospyros Kaki* (Ebenaceae): A review. ***Asian Journal of Research in Pharmaceutical Sciences* 2011**, 1(3): 55-58
64. Singh S, Joshi H and Prasad R. Antifungal potential of rootbark of *Diospyros Kaki* against some human pathogenic fungi. ***Der Pharmacia Sinica* 2011**, 2(5) : 210-216
65. Singh S, Prasad R, Pathania K and Joshi H. Antifungal activity of Plumbagin and Isodiospyrin on human pathogenic fungi. ***Asian Journal of Plant Science and Research* 2012**, 12: 1-5
66. Suman R, Sharma P, Gupta S, Sourirajan A and Dev K. A Novel Psychrophilic *Janthinobacterium lividum* MMPP4 Isolated from Manimahesh Lake of Chamba District of Himachal Pradesh. ***Journal of Biochemical Technology* 2015**, 6(1): 846-851
67. Thakur N and Tripathi A. Biological management of damping off buckeye rot and Fusarium wilt of tomato (cv. Solan lalima) under mid hill conditions of Himachal Pradesh. ***Agricultural Science* 2015**, 6: 535-544.
68. Thakur N and Tripathi A. Impact of integrated organic approaches compared to conventional approaches on small scale tomato (cv. Solan lalima) production system in terms of sustainability and profitability under mid hill conditions of Himachal Pradesh. ***Journal of African Research in Business and Technology* 2015**, (Accepted).
69. Tickoo M, Farooq U, Bhatt N, Dhiman M, Alam A, Khan MA and Jaglan S. Alternariol: Secondary metabolites derived from endophytic fungi *Alternaria* spp. isolated from *Catharanthus roseus* ***Universities' Journal of Phytochemistry and Ayurvedic Heights* 2015**, (Accepted).
70. Tripathi A, Upadhyay RC and Singh S. Mineralization of mononitrophenols by *Bjerkandera adusta* and *Lentinus squarrosulus* and role of ligninolytic enzyme. ***Journal of Basic Microbiology* 2011**, 51: 635-649.
71. Tripathi A, Upadhyay RC and Singh S. Extracellular ligninolytic enzymes in *Bjerkandera adusta* and *Lentinus squarrosulus*. ***Indian Journal of Microbiology* 2012**, 52(3): 381-387.
72. Walia A, Mehta P, Chauhan A, Kulshrestha S and Shirkot CK. Purification and characterization of cellulose free low molecular weight endo β -1,4 xylanase from alkalophilic *Cellulosimicrobium*

cellulans CKMX1 isolated from mushroom compost. *World Journal of Microbiology and Biotechnology* 2014, 30(10): 2597-2608.

23. Details of patents and income generated

The faculty members of the School have been able to file patents from the translational research outputs as per details below:

Table BT012: List of patents filed by the faculty members of School of Biotechnology

S. No	Title of the patent	Faculty Name	Patent filing no
1	Compound for enhancing activity of antibiotic compositions and overcoming drug resistance.	Umar Farooq, Tanuja Rana, Navroop Kaur	1229/DEL/2015
2	Novel peptide sequence for developing diagnostic agents for malaria detection.	Umar Farooq, Nazam Khan, Shakti Pal Singh Chauhan	1228/DEL/2015
3	Novel peptide sequences for developing anti-malaria vaccines and therapeutic compounds.	Umar Farooq, Nazam Khan, Shakti Pal Singh Chauhan	1465/DEL/2015
4	Terpenoids from <i>Colebrookea oppositifolia</i> as activity enhancers of antibiotic compositions and extraction method thereof.	Kamal Dev, Anuradha Sourirajan, Vipasha Sharma	1326/DEL/2015
5	Compounds for enhancing activity of antibiotic compositions against drug sensitive and drug resistant bacteria.	Kamal Dev and Kazal Pathania	1429/DEL/2015
6	Phytocompounds from <i>Vitex nigundo</i> for enhancing antibiotic activity and overcoming drug resistance.	Kamal Dev, Anuradha Sourirajan, Sonika Gupta	1464/DEL/2015
7	A novel microbe producing extracellular β -galactosidase and method of enzyme production thereof	Kamal Dev, Tarun Kumar	1895/DEL/2015

24. Areas of consultancy and income generated:

School of Biotechnology encourages faculty members to conduct consultancy services in the areas of their expertise. Following are the details of consultancy services provided:

Table BT013: Consultancy provided in the areas of Biotechnology

S.No.	Faculty	Consultancy Topic	Institute/Organization
1	Dr Saurabh Kulshrestha	Polymerase Chain Reaction and its application	State Council of Educational Research and Training, Solan
2	Dr Saurabh Kulshrestha	Human Genome Project and applications	State Council of Educational Research and Training, Solan

25. Faculty selected nationally / internationally to visit other laboratories / institutions / industries in India and abroad

- Dr Saurabh Kulshrestha selected under DBT CREST award scheme to visit USA.

26. Faculty serving in

a) National committees:

Prof. D. R. Sharma, member Research advisory Committee to ICAR Institutes

b) International committees:

Prof. D. R. Sharma, member Indo-US Management Team

Prof. D. R. Sharma, UNESCO & FAO fellow in USA & Morocco,

c) Editorial Boards

Table BT014: List of faculty members serving in editorial boards of Journals and Societies

S.No.	Name of Faculty	Position	Journal/Society
1	Prof P. C. Sharma	Editor	Indian Journal of Veterinarians
2	Prof. P. C. Sharma	Editorial consultant	Indian journal of Veterinary Research
3	Dr Kamal Dev	Member	Universal Journal of Microbiology research and Academic Journals
4	Dr Umar Farooq	Member	Journal of Pharmaceutical Sciences and Allied Research
5	Dr Umar Farooq	Member of Advisory Committee	Universities Journal of Phytochemistry and Ayurvedic Heights

d) any other (please specify)

Three faculty members have served as reviewers for manuscripts of journals indexed in Scopus

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

Table BT015: List of recharging strategies for member of School of Biotechnology

S.No	Academic Staff Development Programs		No. of Faculty Members
1	Refresher courses	---	---
2	HRD Programs	---	---
3	Orientation Programs	---	---
4	Staff training conducted by the University	1. eUniv Workshops by Mr Kamal Kant, Assistant Professor, MBA Shoolini University, 2013 & 2014 2. Faculty Development Program conducted by Faculty of Management Sciences, Shoolini University 3. Sensitization Program in collaboration with Ennoble IP 4. Train the Trainer workshop on IPR organized in collaboration with Corporate IP consultants	8 5 5 5
5	Staff training conducted by other Colleges/ University	---	---
6	Summer / winter Schools, workshops, etc.	Workshop on Advances in Electron Microscopy and Allied Fields (NWAEMA-2011) held in Shoolini University, September 2011	4
7	Any other (please Specify)	Conferences : national and International	9
		Thesis & Paper Writing, 16 th April, 2015 by Prof. Klaus von Gadow, University of Germany	9
		“Innovation, Innovative Minds Impacting Change”, 6 th April, 2015 by Dr. P.S. Ahuja, former Director General, CSIR	10
		“Latest Trends and Scientific Innovations”, 20 th March, 2015 by Dr. Niranjani Bilgi	8
		Research Writing, 2013 by Ms Andrea Wright, Brown University, USA	8

28. Student projects

All the programs offered in the School of Biotechnology have mandatory research projects as part of curriculum. Most of the students undergo in house research projects and some of the students pursue research project in other reputed research institutes/Industries.

- percentage of students doing in house projects including inter-departmental projects: 88%

- percentage of students doing projects in collaboration with other universities / industry / institute: 12%

Table BT016: List of total numbers of research projects executed by student of School of Biotechnology

No. of Programs with Students Project/research as mandatory course	Number of projects Executed (completing by June)
M.Sc. Biotechnology	87
M.Sc. Microbiology	51
M.Sc. Biochemistry	03
M.Phil. Biotechnology	19
M.Phil. Microbiology	38
M.Tech Biotechnology	27
Dual Degree in Biotechnology	14
Ph.D. Biotechnology	10
Ph.D. Microbiology	11
B.Sc. Biotechnology	-
B.Sc. Microbiology	-

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

Faculty and students of School of Biotechnology have been recognized by various funding agencies in terms of research grants sanctioned and awards conferred.

Faculty members:

- Prof. D. R. Sharma: UNESCO & FAO fellow in USA & Morocco
- Dr Anuradha Sourirajan, DBT-BIOCARE for women scientists, 2011
- Dr Astha Tripathi, DBT-BIOCARE for women scientists, 2013

- Dr Saurabh Kulshrestha was awarded with DBT-CREST award for year 2012.

Doctoral/ postdoctoral students:

- Ms. Varsha Rani conferred INSPIRE research fellowship in 2010
- Ms. Nazam Khan conferred Maulana Azad National Fellowship in 2011
- Mr. Jitender Kumar conferred Rajiv Gandhi National Fellowship in 2011
- Ms. Poonam conferred Rajiv Gandhi National Fellowship in 2011
- Ms. Bharti conferred Rajiv Gandhi National Fellowship in 2012
- Ms. Tanvi Gupta conferred INSPIRE research fellowship in 2014
- Ms. Neha Chauhan conferred INSPIRE research fellowship in 2014

Students:

1. Shivali Pathania received Best Poster award, for the paper entitled “Sources and Mineral Constituents on Solid State fermentation of Brewer’s spent grains for Citric acid production”. In: Indo Italian workshop on Food Technology and Cold Chain Management. November, 26-27, Amity University, Noida, (New Dehli NCR) Campus, India”
2. Nitika Thakur, received first prize in oral session titled “Technological intervention through different systems of cultivation presented at National Conference on Recent Developments in Science and Technology (ISRS); 2014 Oct 10-12; Department of Biotechnology, HPU Shimla, Himachal Pradesh.
3. First Prize on Research paper, entitled “Neha, Shakti Chauhan, Yashu Sharma, Shilpi Tagore, Alam A and U Farooq, Screening of medicinal plants for antityphoidal activity against multidrug resistance *Salmonella typhi*”, 2014
4. Himika Gupta received Dr. Anji Reddy Award (2011) by Physiological Society of India Annual Conference, NRI Medical College and General Hospital, AP.
5. Ali R, Farooq S, Farooq U received Best Poster Award in "National Seminar On Bio-Degradation and Bioremediation -A Novel Remedy for pollution Abatement" Saturday,18th February 2012.

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

Following is the list of Seminars/ Conferences/Workshops jointly organized by the faculty members of School of Biotechnology and School of Bioengineering and food Technology:

Table BT017: List of Seminars/Conferences/Workshops organized by the School of Biotechnology

Source of Funding	Details	Outstanding Participants
DBT, Govt of India	Training cum seminar on Molecular Biology techniques for college lecturers (November 10-19, 2011): Rs. 50000.00	- Prof. S.K. Sharma, Vice Chancellor, HPKV, Palampur. - Prof. H.S. Dhaliwal, Department of Biotechnology, IIT Roorkee - College teachers and research scholars
Shoolini University	Fascination of Plants Day” in collaboration with European Plant Science Organization (EPSO) for creating awareness amongst the people about the environment and its value for the human society (18 may 2012 & 17 may 2013).	Prof. K.R. Dhiman, Vice Chancellor, UHF, Nauni
MOA, Govt of India	Awareness Program for farmers on Protection of Plant Varieties and Farmers Rights, sponsored by PPV&FRA, Ministry of Agriculture (February 19, 2013): Rs. 80000.00.	-Prof. K. Kumar, UHF, Nauni -Prof. R.K. Kohli -Farmers
Shoolini University	Sensitization Program in collaboration with Ennoble IP to provide awareness about IPR and encourage creativity among the faculty and students (July 30, 2014; August 13, 2014).	-Teachers and students
Shoolini University	Train the Trainer workshop on IPR organized in collaboration with Corporate IP consultants, Mohali (April 8, 2015).	-Dr. Parikshit Bansal, Corporate IP consultants -Teachers and students

31. Code of ethics for research followed by the departments

- ICMR code of ethics has been followed for research in Biotechnology and Microbiology.
- Joint Research and Development Committee (JRDC) and Institutional Ethical Committee (IEC) ensure that the research ethics of ICMR is followed.

32. Student profile Program-wise:

Table BT19: Program-wise profile of students in the School of Biotechnology

Courses	Year	Name of the Program (refer to question no. 4)	Applications received	Selected		Pass percentage	
				Male	Female	Male	Female
B.Sc	2014-15	Biotechnology	55	10	28	NA	NA
	2014-15	Microbiology	34	9	21	NA	NA
M.Sc	2009-10	Biotechnology	40	3	2	100	100
	2010-11		75	41	29	100	100
	2011-12		50	21	21	88	100
	2012-13		25	4	16	100	100
	2013-14		26	3	9	100	100
	2014-15		16	7	5	100	100
	2009-10	Microbiology	40	4	0	100	100
	2010-11		45	12	24	100	100
	2011-12		30	11	14	88	100
	2012-13		25	5	17	100	100
	2013-14		10	3	6	100	100
	2014-15		18	8	4	100	100
	2012-13	Biochemistry	1	0	1	100	100
	2013-14		3	0	2	100	100
M.Tech	2010-12	Biotechnology	14	4	7	100	100
	2011-13		10	2	6	100	100
	2012-14		6	1	4	100	100
	2013-15		6	0	3	100	100
	2014-16		17	7	8	NA	NA
	2009-14	Dual Degree Biotechnology	8	5	3	100	100
	2010-15		6	3	3	100	100
	2011-16		4	2	2	NA	NA
	2012-17		8	5	3	NA	NA
M.Phil	2010-11	Biotechnology	12	1	9	100	100
	2011-12		12	1	7	100	100
	2012-13		10	2	6	NA	83
	2013-14		8	1	2	NA	100
	2014-15		5	1	3	NA	NA
	2010-11	Microbiology	18	7	10	100	100
	2011-12		16	2	11	100	100
	2012-13		6	0	4	NA	100
	2013-14		10	1	7	NA	85
	2014-15		5	0	3	NA	NA

Courses	Year	Name of the Program (refer to question no. 4)	Applications received	Selected		Pass percentage	
				Male	Female	Male	Female
PhD	2009-10	Biotechnology	11	4	3	100	100
	2010-11		24	3	10	66	70
	2011-12		14	2	9	NA	11
	2012-13		22	6	12	NA	NA
	2013-14		17	1	9	NA	NA
	2014-15		15	2	3	NA	NA
	2009-10	Microbiology	12	2	4	100	100
	2010-11		14	5	4	60	75
	2011-12		13	4	6	NA	38
	2012-13		10	2	8	NA	NA
	2013-14		19	2	8	NA	NA
	2014-15		10	0	4	NA	NA

NA*: ongoing students

33. Diversity of students

Table BT19: Program-wise diversity of students in the School of Biotechnology

Name of the Program (refer to question no. 4)	% of Students from the Same University	% of students from other universities within the State	% of students From Universities outside the State	% of Students from other countries
M.Sc Biotechnology	Nil	65	35	Nil
M.Sc Microbiology	Nil	67	33	Nil
M.Sc Biochemistry	Nil	50	50	Nil
M.Tech. Biotechnology	23	Nil	77	Nil
M.Tech. Dual Degree Biotechnology	100	Nil	Nil	Nil
M.Phil Biotechnology	25	50	25	Nil
M.Phil Microbiology	Nil	67	33	Nil
PhD Biotechnology	20	50	30	Nil
PhD Microbiology	25	50	25	Nil

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

Table BT20: List of students the School of Biotechnology who have qualified national level examinations

S.No	Name of the fellowship	No. of students qualified
1	CSIR-UGC NET	05 (Kirti, Dinesh Kumar, Pradeep Kumar, Manoj Kumar, Rupjyoti Kalita)
2	ARS-NET	01 (Dinesh Kumar,)
3	DST-INSPIRE	03 (Varsha Rani, Neha Chauhan, Tanvi Gupta)
4	GATE	4 (Amit Kumar, Kirti, Varun Chauhan, Divyanshi Sharma)
5	UGC-Rajiv Gandhi Fellowship	03 (Jitender Kumar, Poonam Kumari, Bharti)
6	UGC-Maulana Azad Fellowship	01 (Nazam Khan)

35. Student progression within Shoolini University

Table BT21: Details of student progression in the School of Biotechnology

Student progression	Percentage against enrolled
UG to PG	10%
PG to M.Phil.	5%
PG to Ph.D.	5%
Ph.D. to Post-Doctoral	NA
Employed	
Campus selection	23%
Other than Campus recruitment	76%
Entrepreneurs	1%

36. Diversity of staff

Table BT22: Diversity of faculty members in the School of Biotechnology

Percentage of faculty who are graduates	Ph.D.
of the same University	10%
from other universities within the State	20%
from universities from other States	60%
from universities from other Countries	10%

37. Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period: 2 (listed below)

Table BT23: List of faculty members awarded Ph.D. in the last 5 years

Name of Faculty Member	Year of Award of Ph.D. degree
Sheetal Mehta	2014
Astha Tripathi	2010

38. Present details of departmental infrastructural facilities with regard to

a) Library

Yogananda library of Shoolini University is fully digitized and houses text books, reference books, journals, magazines and newspapers both in hard bound and as e-resource sufficient for academic and research requirements of the students. All the e-resources are available to the faculty and students through Learning Management System (LMS) and Knowledge Management System (KMS). Yogananda library has subscription to a number of learning packages from EBSCO which includes more than a lakh e-books and ~9000 research journals etc.

In addition to central library each school has its own virtual library which is linked to the central library with a minimum physical books and journals. All the study material available in the central library can be easily used through school libraries. School library also contains thesis, dissertations, project reports etc

Following is the study material related to Biotechnology/Microbiology available through school library :

- Total Books available: 5990 + more than 1 lakh e-books
- Reference Books available: 480
- Journals: 17 + 9000 e-journals (combined science, technology and management)

b) Internet facilities for staff and students

LAN (1000 Mbps of local network connected via fiber and cat 6) on desktops and Wi-Fi throughout Faculty/Campus

c) Total number of class rooms: 3 dedicated class rooms. In addition, University prepares a centralized time table and assigns the classrooms as per the need.

d) Class rooms with ICT facility: 2 class rooms with ICT facility and one movable projector.

e) Students' laboratories: six as mentioned below:

Table BT24: List of laboratories available in the School of Biotechnology for student practical

Laboratory	Description
UG1 Biotechnology	Biotechnology Undergraduate Lab is well equipped with facility to conduct practical at B.Sc. Biotechnology Level. The Lab contains Laminar Air Flow, Autoclave, -20 degree freezer, Ovens, Incubators, Shaker etc.
UG1 Microbiology	Microbiology Undergraduate Lab is well equipped with facility to conduct practical at B.Sc. Microbiology Level. The Lab contains Laminar Air Flow, Autoclave, Microscopes, Water Purification system etc.
PG1 Biotech	Biotechnology Postgraduate lab is well equipped with facility to conduct practical at M.Sc. Biotechnology Level. The laboratory consists of Laminar Air Flow, Autoclave, distillation unit etc.
PG1 Micro	Microbiology Postgraduate Lab is well equipped with facility to conduct practical at M.Sc. Microbiology Level. The Lab contains Laminar Air Flow, Autoclave, Microscopes, Water Purification system etc.
CIL	Instrumentation lab caters the need of all students (Both UG, PG and research) for the use of sophisticated instruments required for their work. This lab contains -80 degree freezer, Gel documentation system, Refrigerated Shakers, Refrigerated Centrifuge, PCR Machines, Ovens, Incubators, Microscope Water bath shaker etc.
Bioinfo Lab	Bioinformatics Lab is well equipped with computers with internet connections sufficient to conduct routine bioinformatics practicals at UG and PG level.

f) **Research laboratories: 09**

Table BT26: List of laboratories available in the School of Biotechnology for student projects and externally funded research projects

Laboratory	Description
Resl Biotech	Biotechnology Research Lab is involved in the production and optimization of conditions for enzymes that find wide applications in different fields including agriculture, medicine, pharmaceutical and food industry. The laboratory supports research projects UG, PG and Ph.D. students. The Lab contains Refrigerated Incubator Shaker, -20 degree freezer, Microscope, Soxhlet apparatus etc.
ReslMicro	Microbiology Research Lab engaged in characterization of human and animal (bacterial and fungal) pathogens. The laboratory supports research projects UG, PG and Ph.D. students. The Lab contains Biosafety hood, ELISA reader, BOD incubator, Shaker, Microscope etc.
Mycology Lab	Mycology Lab engaged in research on wild Macro Fungi for isolation of bioactive molecules to be used for medicinal and food purpose. The laboratory supports research projects UG, PG and Ph.D. students. The Lab contains PCR Machine, BOD incubator etc.
MPMI LAB	Molecular plant microbe interaction lab engaged in research on various aspects of Plant Microbe Interactions. It supports the research work of UG, PG and Ph.D. students. The Lab contains Type I Water Purification system, Refrigerated Incubator Shaker, UV-VIS Spectrophotometer, Plant Growth Chamber, PCR machine etc.
YBL	Yeast biology lab engaged in research in the areas of yeast cell cycle, yeast translation, phytomedicine, industrial enzymes and biology of extremophilic microbes. The laboratory supports research projects UG, PG and Ph.D. students. The Lab contains Fastprep, Refrigerated Incubator Shaker, Waterbath shaker, Rotaevaporator, Ice Machine, Gyrotwister etc.
LGR LAB	Laboratory of gene regulation engaged in research on various aspects of Gene regulation. The laboratory supports research projects UG, PG and Ph.D. students. The Lab contains Refrigerated Incubator Shaker, Refrigerated Centrifuge, PCR Machine, Electroporator, etc.
MIPL	Molecular immuno-parasitology research lab engaged on various aspects of Immunopathology of Malaria, Leishmaniasis, genetic polymorphism of <i>E. granulosus</i> , drug discover for leishmaniasis and vaccine development for Malaria. The laboratory supports research projects UG, PG and Ph.D. students. The Lab contains Laminar Air Flow, Fluorescent ELISA reader, Gel documentation system, BOD incubator, etc.
ABL	Animal Biotechnology lab engaged in research on effects of immunomodulators extracted from various plants on human immune cells thereby understanding the interaction of these immune cells with cancerous cells. The laboratory supports research projects UG, PG and Ph.D. students. The Lab contains -20 degree freezer, Biosaftey hood, Cell culture facility etc.
PTCL	Plant Tissue culture lab engaged in micropropagation of economically important endangered medicinal plants. The laboratory supports research projects UG, PG and Ph.D. students. The Lab contains laminar air flow, environmentally controlled plant growth facility etc.

39. List of doctoral, post-doctoral students and Research Associates**a) from the host institution/University: 17 % PhD****Table BT27: Batch wise list of Ph.D. Microbiology and Ph.D. Biotechnology students**

S. No.	Registration No.	Name of the student	Status
1.	12MCD05	Pooja Patial	Ongoing
2.	12MCD08	Arti Bains	Ongoing
3.	12MCD09	Mohini Dhiman	Ongoing
4.	12MCD10	Nidhi Bhatt	Ongoing
5.	12MCD11	Bharti	Ongoing
6.	12MCD12	Naveen Minhas	Ongoing
7.	13MCD01	Neha Chauhan	Ongoing
8.	13MCD02	Neha Thakur	Ongoing
9.	13MCD07	Sukrit Sagar	Ongoing
10.	14MCD04	Kajal Kumari	Ongoing
11.	12BTD21	Sukhvire Kaur	Ongoing
12.	13BTD06	Rakesh Kumar	Ongoing
13.	13BTD07	Tanvi Gupta	Ongoing
14.	13BTD08	Amandeep Thakur	Ongoing
15.	14BTD02	Divyanshi Sharma	Ongoing
16.	14BTD04	Gaurav Thakur	Ongoing

b) from other institutions/universities: 83% PhD**Table BT28: Batch wise list of Ph.D Microbiology and Ph.D. Biotechnology students**

S. No.	Registration No.	Student Name	Status
COMPLETED/SUBMITTED			
17.	MC-09-D-02	Amit Kumar	Completed
18.	MC-09-D-03	Devender Kumar Sharma	Completed
19.	MC-09-D-04	Kazal Pathania	Completed
20.	MC-09-D-09	Sheetal Mehta	Completed
21.	MC-09-D-10	Sushila Devi Negi	Completed
22.	MC-09-D-11	Harjeet Kaur	Completed
23.	MC-10-D-01	Aradhana Dohroo	Completed
24.	MC-10-D-02	Patil Sandeep Shripati	Completed
25.	MC-10-D-03	Ruchi Chauhan	Completed
26.	MC-10-D-04	Shakti Pal	Submitted
27.	MC-10-D-06	Vikesh K Bhatia	Completed
28.	MC-10(II)-D-08	Usha Devi	Completed
29.	MC-11-D-03	Nazam Khan	Submitted

S. No.	Registration No.	Student Name	Status
30.	MC-11-D-07	Tanuja Rana	Submitted
31.	MC-11-D-08	Navroop Kaur	Submitted
32.	BT-09-D-02	Anil Kumar	Submitted
33.	BT-09-D-03	Anshul Sharma	Completed
34.	BT-09-D-04	Chandrika Attri	Completed
35.	BT-09-D-08	Vipasha Sharma	Completed
36.	BT-09-D-10	Tarun Kumar	Completed
37.	BT-10-D-01	Anil Kumar	Submitted
38.	BT-10-D-02	Jitender Kumar	Completed
39.	BT-10-D-04	Meenakshi Sharma	Completed
40.	BT-10-D-06	Parul Sharma	Submitted
41.	BT-10-D-10	Sonika Gupta	Completed
42.	BT-10-D-11	Sujata Chauhan	Submitted
43.	BT-10(II)-D-05	Monika	Completed
44.	BT-10(II)-D-13	Himika Gupta	Completed
45.	BT-11-D-13	Shivani Kaushal	Submitted
ONGOING			
46.	BT-10-D-09	Shweta Chauhan	Ongoing
47.	BT-10-D-07	Prachi Gupta	Ongoing
48.	BT-09-D-07	Varsha Rani	Ongoing
49.	BT-09-D-01	Abhishek Sharma	Ongoing
50.	13MCD08	Kavita Bhaita	Ongoing
51.	13MCD09	Anju Bala	Ongoing
52.	13MCD10	Manjeet Singh	Ongoing
53.	14MCD01	Shweta	Ongoing
54.	14MCD02	Neha Thakur	Ongoing
55.	14MCD03	Monika Verma	Ongoing
56.	MC-11-D-04	Poonam Kumari	Ongoing
57.	MC-11-D-05	Pradeep Kumar	Ongoing
58.	MC-11-D-06	Rohina Chaudhary	Ongoing
59.	MC-10-D-05	Varun Chauhan	Ongoing
60.	MC-10(II)-D-02	Kiran Mahant	Ongoing
61.	MC-10(II)-D-03	Lalit Kumar	Ongoing
62.	MC-11-D-01	Arushdeep Sidana	Ongoing
63.	MC-11-D-02	Devender Singh	Ongoing
64.	BT-10-D-08	Rampa Thakur	Ongoing
65.	MC-11-D-12	Ashwani Kumar	Ongoing
66.	MC-11-D-13	Neha Sharma	Ongoing
67.	12MCD01	Rakesh Kumar	Ongoing
68.	12MCD02	Poonam Dhillon	Ongoing
69.	12MCD03	Nitika Thakur	Ongoing
70.	12MCD07	Mridula Gupta	Ongoing

S. No.	Registration No.	Student Name	Status
71.	BT-10-D-12	Raquib Ali	Ongoing
72.	BT-10(II)-D-01	Aparna Aggarwal	Ongoing
73.	13MCD03	Anterpreet Kaur Chahal	Ongoing
74.	13MCD04	Jyoti Mehta	Ongoing
75.	13MCD05	Urmila	Ongoing
76.	13MCD06	Priyanka Chauhan	Ongoing
77.	BT-11-D-03	Divya Vishanbra	Ongoing
78.	BT-11-D-04	Karan Surya	Ongoing
79.	BT-11-D-05	Mohit Sharma	Ongoing
80.	BT-11-D-06	Neha Bhardwaj	Ongoing
81.	BT-11-D-07	Prabhjot Kaur	Ongoing
82.	BT-11-D-08	Preety Dogra	Ongoing
83.	BT-11-D-09	Renu Parmar	Ongoing
84.	BT-11-D-10	Sapna Thakur	Ongoing
85.	BT-11-D-02	Ankita Deshta	Ongoing
86.	BT-11-D-14	Ansu Kumari	Ongoing
87.	12BTD01	Aditi Gupta	Ongoing
88.	12BTD02	Akshita Sharma	Ongoing
89.	12BTD03	Ankur Kaushal	Ongoing
90.	12BTD04	Kanchan Heer	Ongoing
91.	12BTD05	Mamta Sharma	Ongoing
92.	12BTD06	Manoj Kumar	Ongoing
93.	12BTD07	Nitin Sharma	Ongoing
94.	12BTD08	Poonam	Ongoing
95.	12BTD09	Rajni Vaid	Ongoing
96.	12BTD11	Shikha Guleria	Ongoing
97.	12BTD12	Shikha Kumari Rangra	Ongoing
98.	12BTD13	Shiney Hangloo	Ongoing
99.	12BTD14	Sunny Bindra	Ongoing
100.	12BTD15	Vikas Kumar	Ongoing
101.	12BTD17	Shagun Gupta	Ongoing
102.	12BTD18	Rupak Nagraik	Ongoing
103.	12BTD20	Deepika Rana	Ongoing
104.	13BTD01	Sonam Sharma	Ongoing
105.	13BTD02	Shivani Vaidya	Ongoing
106.	13BTD04	Manju Kashyap	Ongoing
107.	13BTD05	Jyoti	Ongoing
108.	13BTD09	Janmeet Kour Bali	Ongoing
109.	13BTD13	Indu Hira	Ongoing
110.	14BTD01	Reena Kumari	Ongoing
111.	14BTD03	Ashu Mohammad	Ongoing
112.	14BTD05	Abhishek Bharwaj	Ongoing

c) **post-doctoral and Research Associate:** Nil

40. Number of post graduate students getting financial assistance from the University: 16

Table BT29: Details of post graduate students getting financial assistance from Shoolini University

S. No	Name of student	Program
1	Isha Sharma	M.Sc (Biochemistry)
2	Neha	M.Sc (Biotechnology)
3	Sanea Saher	M.Sc (Biotechnology)
4	Ruchi Sharma	M.Sc (Microbiology)
5	Chandini Dhiman	M.Sc (Microbiology)
6	Depti	M.Phil (Microbiology)
7	Anupriya	M.Phil (Microbiology)
8	Tanvi Gupta	Ph.D. (Biotechnology)
9	Neha	Ph.D. (Microbiology)
10	Kajal Kumari	Ph.D. (Microbiology)
11	Sapna Devi	M.Tech (Biotechnology)
12	Karan Jaswal	M.Tech (Biotechnology)
13	Shiny Bala	M.Tech (Biotechnology)
14	Jaspreet Kaur	M.Tech (Biotechnology)
15	Vivek Verma	M.Tech (Biotechnology)
16	Sachin Kumar	M.Tech (Biotechnology)

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

Yes, assessment exercise is undertaken by the academic committee (includes Dean of the faculty, Head of the School and all the faculty members) of the School to start any new programs.

After assessing the demand of skilled professionals of the biotech industry and research in India, proposal for starting new program is formulated and presented before the board of studies of the School (it includes two external experts from academia and industry in addition to the members of the academic committee). Once it is approved, the proposal is sent to the Academic Council of the University. The Academic council takes the decision based on the current trends in the field and its necessity.

42. Does the department obtain feedback from

a. faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

As the curriculum is outcome driven, the School obtains regular feedback from faculty members regarding curriculum as well as teaching-learning-evaluation. Feedbacks are discussed in the Board of Studies of the School and necessary changes, if required are incorporated after obtaining consent from the academic council. For example, students are accepted from all life sciences back ground (including Biotechnology and Microbiology) for postgraduate programs. After getting feedback from the faculty, credit courses specific for CSIR-UGC NET/GATE examinations were included as a part of course curriculum.

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

Feedback on staff, curriculum and teaching-learning-evaluation is taken from students every semester on a pre-designed proforma. All the suggestions of students are considered for further development. The feedbacks are further discussed in the Board of Studies and the faculty members are advised to adopt the teaching pedagogy as per student feedback.

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

Alumni feedbacks are collected during the “Alumni Meet” and “Convocations” and adopted for the new courses, improvement of the course curriculum. School utilizes the feedback from employers to revise the course curriculum to make it industry centric.

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

The School of Biotechnology was established in 2009 and only 4 batches of post graduation programs have passed out. Most of the students choose to pursue research (M.Phil./Ph.D.) as a career, and few students intend to take up jobs. The list of alumni working in reputed companies and pursuing research at reputed institutes is given below:

Table BT30: Details of distinguished alumni of School of Biotechnology

S. No	Name of the student	Institutes/Industry
1	Mr. Manoj Kumar (M.Sc. Biotechnology)	JRF (CSIR NET), PGIMER Chandigarh
2	Dr Tarun Kumar (Ph.D. Biotechnology)	IP executive, Corporate IP consultants, Mohali
3	Ms. Heena Sharma (M.Sc. Microbiology)	Pharmacovigilance Scientist, Quantum Solutions Chandigarh
4	Mr. Arvind Chandel (M.Sc. Biotechnology)	Orbit Biotech Pvt. Ltd. Mohali, Punjab
5	Mr. Natesh Kumar (M.Sc. Biotechnology)	Panacea Biotech ltd vaccine formulation unit, Baddi
6	Mr. Vishnu (M.Sc. Biotechnology)	Genaxy Scientific Pvt. Ltd
7	Mr. Rupjyoti Kalita (M.Sc. Biotechnology)	JRF, Guwahati University
8	Ms. Anupama (M.Sc. Biotechnology)	SRF, CPRI, Shimla
9	Ms. Sonika Kalia (M.Sc. Biotechnology)	INSPIRE research fellow, Department of Biotechnology, HPKV, Palampur
10	Ms. Kanika Arora (M.Sc. Microbiology)	JRF (INSPIRE), Institute of Nuclear Medicine and Allied Sciences (DRDO), New Delhi
11	Kirti Singh (M.Tech. Biotechnology)	CSIR-JRF, JNU, New Delhi
12	Mamta Kumari (M.Tech. Biotechnology)	Executive, Biocon, Bangalore
13	Mr. Arun Kumar (M.Tech. Biotechnology)	Remote Technical Engineer, Agilent Technologies

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

School of Biotechnology regularly invites Biotechnology/Microbiology experts from academia and industry to share the views with students and the faculty. In addition, students also get exposure to expert's advice during Guru Series lectures as part of Yogananda Knowledge Initiative, Biospectrum lecture series and INSPIRE science camps. List of some of the invited guest speakers in the School of Biotechnology is enumerated as under:

Special lectures organized:

- Prof. A.K. Bhatt Biotech park of Himachal Pradesh: Status and

future prospects. Department of Biotechnology, H. P. University Shimla.

- Prof. S. P. Vij Plant Diversity: Conservation and Sustainable Development for Community Livelihood. Professor Emeritus & NASI Senior Scientist, Panjab University, Chandigarh.
- Prof. S. S. Kanwar Stem cells in regenerative medicine. Department of Biotechnology, H. P University Shimla.
- Prof. I.S. Dua, Understanding self: romance with biology. Emeritus Professor, P. U. Chandigarh.
- Prof. R.K. Kohli, Alien Plant Invasion: Ecological Impact in India. Dean Research, Department of Botany, P. U. Chandigarh.
- Prof. S.C. Verma, Fathoming The Pteridophyte Genome: Challenges And Opportunities. Botany Department, P. U. Chandigarh.
- Prof. H.V. Batra, Director, Defense Food research Laboratory, Mysore
- Prof., N. S. Thakur, University of Horticulture & Forestry, Solan
- Prof. Sonal Malhotra, Addis Ababa Institute of Technology, Ethiopia
- Prof. Duni Chand, HP University, Shimla
- Mrs. Shweta Singh, Director, Innobel, New Delhi
- Prof. Kulwant Rai, University of Horticulture & Forestry, Solan
- Prof. David Bergeron Thoughts from a “Hidden Physicist”. Oliver Wyman, USA.
- Dr. Duni Chand, Role of Plants in Human Life. Department of Biotechnology, H. P. University Shimla.
- Prof. H.S. Dhaliwal, Plant Biotechnology, IIT Roorkee
- Prof. S.K. Sharma, Molecular markers in plants, Vice Chancellor, HPKV, Palampur.
- Prof. Krishan Kumar, Protection of plant varieties, UHF, Nauni.

Workshops organized

- Regular SPRINT workshops are organized in School of Biotechnology by SPRINT team of the University to improve soft skills and to improve employability of the students.
- One day workshop was organized on Basics of Flowcytometry by Dr. T. Bind, BD Biosciences, New Delhi.

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

Teaching pedagogy of School of Biotechnology involves both online and offline mode of teaching. Day to day lectures are delivered as combination of chalk board and power point presentations, and are supplemented with the online lectures in the local LMS (e-UNIV), which is in line with technology driven global standards of education. School is in the process of providing the online supplementary study material of all the courses on e-UNIV, which will be accessible to the students 24x7. Some of the important teaching methods adopted are listed below

Online lectures (eUniv): Supplementary study material uploaded to eUniv.

ERP system: Assignments, tests, evaluation and student teacher communication are carried out through indigenously developed ERP system.

Imparting technical skills through practical training: Hands on technical training is provided to the students for majority of the courses in the Program as a part of practical training.

Research: In order to inculcate scientific temper in budding scientists, School offers research projects at B.Sc. level.

Educational visit: School of Biotechnology organizes educational visits to Industry and Research institutes to provide exposure to the students.

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

As per the UGC guidelines the curricula of all of the programs are designed with a clear vision and are outcome oriented. The School follows continuous system of evaluation including term exams, regular surprise tests, quizzes, assignments, practical etc. The outcomes are monitored through following modes

- By getting feedback from the stakeholders and faculty members.
- Regular faculty meetings.
- Internal assessment through assignments, surprise tests/quiz and seminars.
- Interaction of students with designated mentors.

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

To fulfill the social responsibility, all the faculty members and students participate in various extension activities. Some of the extension programs organized at the level of School of Biotechnology are given below:

- Awareness Program for farmers on protection of plant varieties and farmers rights, sponsored by PPV& FRA, Ministry of Agriculture (February 19, 2013).

- DBT sponsored training cum seminar on molecular biology techniques for college lecturers was conducted from November 11-19, 2012.
- Training was imparted to School level lecturers on practical skills on Biotechnology.
- Faculty members are involved in delivering talks on Biotechnology and Microbiology in various Schools and colleges of Himachal Pradesh.

Extension activities organized at central level, where members of School of Biotechnology are involved are listed below:

- Swatch Bharat Abhiyan
- Tree Plantation Drive
- Blood Donation Camps
- Flower Fest
- Science exhibition
- Seminars organized under the aegis of Him Science Congress Association
- Celebration of World Environment Day, Earth Day, Cancer Awareness Day, Women's Day, Yoga Day etc.
- Marathon on teachers day

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

School of Biotechnology promotes all the students to participate in scholarly activities in addition to the prescribed course curriculum. Some of these activities are listed below

- SPRINT Program helps in developing leadership qualities, personality development and improving communication skills.
- Research students conduct practical training for INSPIRE workshops
- Student participation in inter-departmental and inter University cultural/sports/science/quiz competitions.
- Student participation in various clubs of the University.
- Article writing for magazines
- Guest lectures (Details are mentioned in point 44)
- Participation in national and international conferences
- Voluntary participation of students in all University events.
- Awareness program on Intellectual Property Rights was organized for research students of the School.

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

- School of Biotechnology has been assessed by UGC
- Shoolini University was ranked sixth amongst private biotech Schools in a survey conducted by Biospectrum in 2010 and improved its ranking to second in 2012. Since then, the University has maintained second rank consecutively for the last two years.
- Awarded Excellent University for research in Biotechnology Sciences by Consortium of Co-Chairpersons (Industry) and Gujarat Technological University in 2014.

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

The School of Biotechnology is constantly involved in generating new knowledge both basic and applied, which is either published in reputed peer reviewed journals or has yielded a number of patents that have been filed. The knowledge generated by the school is of societal and industrial relevance. Some of the key research findings are listed below:

- Isolated large number of bacteria and micro-fungi (*Cryptococcus sp.*) and macro-fungi from various regions of Himachal Pradesh, which are capable of producing wide array of industrially important bioactive molecules and enzymes etc.
- Identified novel bioactive molecules from medicinal plants, which are capable of enhancing the efficacy of traditional antibiotics.
- Isolated mycoviruses capable of inducing hypovirulence in plant pathogenic fungi (Potential biocontrol agents).
- Developed a sensitive immunosensor based diagnostic method for the detection of plant viruses.
- Wild mushrooms of Himachal Pradesh have been exploited for novel bioactive compounds.
- Microbes have been isolated having potential to be used for bio remediation.
- Developed peptide based diagnostics for parasitic diseases.
- Established repository of micro and macro flora of North Western Himalayas.
- Developed micro propagation methods of endangered and medicinally important plants using indigenous bioreactors.

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

School of Biotechnology strives to provide quality education to students from diverse spheres of the society. School is constantly evolving to meet the emerging trends and demands of Industry, Academia and Society. Within a short span of five years of its establishment, School of Biotechnology has attained primary level of success in education and research. The School aspires to become a knowledge center of global standard. Towards this mission, the School has identified following strengths, weaknesses, opportunities and challenges:

Strengths:

- All the faculty members are Ph.Ds. and 80% are post doctorate from reputed Institutes of USA and Europe. They are committed in imparting quality teaching and research training in modern areas of biotechnology and microbiology.
- The research potential of the faculty has been endorsed by various funding agencies of Government of India. At its infancy of five years, the school has generated research grants worth around rupees four crores.
- School of Biotechnology has established well equipped research facilities for conducting research in the priority areas with the assistance from Government of India funding agencies and Shoolini University.
- School provides hands on training to UG and PG students in specialized research laboratories of Biotechnology and Microbiology.
- The School has produced more than 70 research publications in journals of national and international repute with highest impact factor of 15 and h index of 4.

Weaknesses:

- School has taken initiatives for research collaboration and student exchange. However, more efforts are required to strengthen the national and international collaborations for research and student exchange.
- School has established facilities to conduct basic research in the thrust areas. However, high-end facilities for modern day Biotechnology need to be created to achieve excellence in research.
- School has also initiated collaborations with industry, but more directional efforts are required to promote alliances with industry towards technology transfer and consultancy.

- Inter-institutional and inter-disciplinary collaborations are required to harness Himalayan biodiversity in a holistic manner.
- Limited job opportunities in specialized fields of Biotechnology and microbiology is a major reason that students do not choose these areas for their career.

Opportunities:

- University is strategically located in the Himalayan hotspot, which is rich in biodiversity that need to be explored by the research team of the School in a holistic manner.
- Solan being the hub of biotech /pharma industries, students have the added opportunity to gain exposure of corporate and research culture.
- Research conducted in the School of Biotechnology has generated more than 70 research publications and 7 patents, which opens doors for technology transfer and revenue generation in the future.
- A number of international collaboration have been manifested by the International office of the University; the School of Biotechnology needs to strengthen its alliances at the international level for joint research, student and faculty exchange, and organizing joint conferences and workshops.
- School has adopted curricula to ensure that large number of students qualify state level and national level examinations. This provides additional opportunity to the students to qualify national and international examinations, such as NET, GATE, GRE, TOFEL etc.

Challenges:

- In the era of globalization, School needs to develop a blue print for International collaboration for excellence in research and education.
- School has already attained first level in terms of research and infrastructure development. The challenge is to transform the research and facilities into the next level in terms of research facilities, infrastructure and its output.
- The curricula of School of Biotechnology are in line with the requirements of academia and research. This need to be harnessed to attract quality students for higher studies in Biotechnology and Microbiology.
- Government support for higher education and research in private sector is not easily accessible as compared to public sector.

52. Future plans of the department

- To further strengthen the research and infrastructure, School aims to procure umbrella projects from Government of India like DST-FIST, DBT- Research Center in Biomics, etc.
- School of Biotechnology plans to organize national and international conferences as a platform for exchange of knowledge and scientific findings.
- The School aims to exploit Research collaborations in India and abroad to obtain research funding from international agencies such as HHMI, WELCOME trust, FORD Foundation etc.
- The School has initiated the use of LMS (e-Univ) as a supplement for classroom teaching, and plans to implement it for all the courses.
- The School has filed 7 patents, which will be exploited for technology transfer and their commercialization.
- The School plans to introduce skill based learning programs for the students to improve their employability.
- School is planning to promote awareness on Biotechnology and Microbiology at School and college levels through motivational lectures and training programs for biotechniques.

2. Evaluative Report of School of Bioengineering and Food Technology

The School of Bioengineering and Food Technology (SBFT) comes under the Faculty of Applied Sciences and Biotechnology and was started in the year 2009. The Biotechnology program of the University is ranked 2nd by the Bio Spectrum among the top Private Universities and the Food Technology program is recognized and supported by the Ministry of Food Processing Industries (MoFPI), which quantifies the commitment of university to deliver quality education and research in these fields of the study. The vision of the School is to develop technically qualified, skilled, competent human resource through excellent teaching and hands on training to cater the needs of Biotech and Food Industries.

The curriculum is designed to meet the contemporary requirements of industry and academia and focus is on the skill development so that the pass outs from the School are job ready and globally competent to play an important role in national development. The School is having a blend of highly experienced and trained faculty from the top National Institutes of India and also support of Post Doctoral teachers of the School of Biotechnology. The B.Tech program for core engineering courses is also supported by the Faculty of Engineering and Technology of the University.

Apart from the infrastructure support of MoFPI the faculty members of the School are also having extramural funding from the national funding agencies viz., DBT and DST, New Delhi. The School is having a track record of student placements in industries of National and International repute besides alliances with industries and international universities for student and faculty exchange programs.

1. Name of the School: School of Bioengineering and Food Technology

2. Year of establishment: 2009

3. Is the School part of a Faculty of the University?

Yes. This School comes under the Faculty of Applied Sciences and Biotechnology

4. Names of programs offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.):

The following UG, PG and Ph.D. programs are offered in the School of Bioengineering and Food Technology:

- B.Tech. Biotechnology
- B.Tech. Food Technology
- M.Tech. Dual Degree in Food Technology
- M.Tech. Food Technology
- M.Sc. Food Technology
- Ph.D. Food Technology

5. Interdisciplinary programs and Schools involved:

The programs running under the School involves multidisciplinary science, which requires support from various Schools across the faculties. Following is the list of other faculties involved in the teaching of selective courses under different programs of the School:

Table SBFT01: List of SBFT Programs supported by other Schools

S. No.	Program	Schools Involved
1.	B.Tech Biotechnology	School of Biotechnology School of Mechanical and Civil Engineering School of Electrical and Computer Science Engineering School of Business Management and Liberal Arts School of Pharmaceutical Sciences School of Biological and Environmental Sciences
2.	B.Tech Food Technology	School of Mechanical and Civil Engineering School of Electrical and Computer Science Engineering School of Business Management and Liberal Arts

6. Courses in collaboration with other universities, industries, foreign institutions, etc.:

The University is having MoU with Gachon University, South Korea for exchange program at UG and PG level. Under this program students are allowed to complete one semester of their B.Tech Biotechnology/Food Technology course at the host University.

Table SBFT02: List of students undertook exchange program at Gachon University, South Korea

S.No.	Name of the student	Session/Batch	Program
1.	Babita Dogra	2011-15	B.Tech Biotechnology
2.	Jasmine Kaur	2011-15	B.Tech Biotechnology
3.	Mehandi Goyal	2011-15	B.Tech Biotechnology
4.	Manorma Negi	2012-16	B.Tech Food Technology
5.	Shubhi Khandelwal	2012-16	B.Tech Food Technology

7. Details of programs discontinued, if any, with reasons: Nil

8. Examination System: Annual/Semester/Trimester/Choice Based Credit System:

At present the School is having semester system of examination. However, Choice Based Credit System (CBCS) is being followed from session 2015-16.

9. Participation of the School in the courses offered by other Schools:

Yes, the School is actively exchanging faculty in programs run by other Schools. Following is the list of courses or electives offered or taught by the faculty members in other Schools:

Table SBFT03: Courses taught by School for programs run by other Schools

Courses	Program	School
Industrial Biotechnology	MBA (Specialization in Biotechnology)	School of Business Management and Liberal Arts
Food Biotechnology	MBA (Specialization in Biotechnology)	School of Business Management and Liberal Arts

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

Following are the details of posts sanctioned and filled in the School:

Table SBFT04: Number of teaching posts sanctioned, filled and actual

Teaching Post	Sanctioned	Filled	Actual (including CAS & MPS)
Professor	1	1	1
Associate Professors	2	2	2
Asst. Professors	18	17	17

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

a) Core teaching faculty

The School is having well qualified and dedicated doctoral and post-graduate faculty members with expertise in different fields of Biotechnology and Food Technology. Following is the list of core faculty members of the School:

Table SBFT05: List of current core faculty of the School

Name	Qualification	Designation	Specialization	Years of experience	Ph.D/ M.Phil students guided for the last 4 years
Dr Dinesh Kumar	Ph.D.	Professor	Biotechnology	14	0/1
Dr. Adesh K. Saini	Ph.D.	Associate Professor	Biotechnology	9	3/1
Dr Somesh Sharma	Ph.D.	Associate Professor	Food Technology	10	Nil
Dr. Amit Seth	Ph.D.	Assistant Professor	Biotechnology	08	1 /2
Dr Pankaj Chauhan	Ph.D.	Assistant Professor	Biochemistry	04	0/1
Dr Ravinder Kaushik	Ph.D.	Assistant Professor	Dairy Chemistry	1.6	0/1
Dr Naveen Kumar	Ph.D.	Assistant Professor	Dairy Chemistry	1.6	Nil
Er Vikas Bansal	M.Tech.	Assistant Professor	Food Engineering	10	Nil
Er Ankur Kaushal	M.Tech.	Assistant Professor	Biotechnology	3.6	Nil
Er. Shalini Jaggi	M.Tech	Assistant Professor	Biotechnology	3.6	Nil
Er. Rupak Nagraik	M.Tech.	Assistant Professor	Food Technology	3.6	Nil
Mr. Rahul Thory	M.Sc., NET	Assistant Professor	Food Technology	0.5	Nil
Dr. Anshul Sharma	Ph.D.	Assistant Professor	Biotechnology	2	Nil
Dr. Chandrika Attri Seth	Ph.D.	Assistant Professor	Biotechnology	2	Nil
Mr. Malay Srivastava*	M.Sc.	Assistant Professor	Bioinformatics	2	NA
Dr. Azhar Khan	Ph.D.	Assistant Professor	Biotechnology	5	Nil
Ms. Archana Sinhmar	M.Sc.,NET	Assistant Professor	Food Technology	-	Nil
Mr. Deepak Kala	M.Tech.	Assistant Professor	Biotechnology	1	Nil
Mr. Vikas Kumar	M.Sc., NET	Assistant Professor	Biotechnology	0.6	Nil
Ms Divya Jyoti	MBA	Assistant Professor	Business Management	4.10	Nil

*Deputed to School of Electrical and Computer Science Engineering for teaching of Bioinformatics (counted for teaching taught ratio in the respective School)

b) Teaching Faculty from other Schools

Besides above core faculty members the following faculty members of other Schools of different faculties are also involved in teaching of UG and PG classes in the School of Bioengineering and Food Technology:

Table SBFT06: List of Faculty Members from other Schools involved in teaching

S.No.	Name	Designation	School
1.	Ms.Poonam Nanda	Associate Professor	School of Electrical and Computer Engineering
2.	Dr Neeraj Gandotra	Associate Professor	School of Electrical and Computer Science Engineering
3.	Mr. Sunil Pathania	Assistant Professor	School of Electrical and Computer Science Engineering
4.	Er. Sunil Kumar	Assistant Professor	School of Electrical and Computer Science Engineering
5.	Ms. Prachi Kapil	Assistant Professor	School of Business Management and Liberal Arts
6.	Ms. Gayatri Katoch	Assistant Professor	School of Mechanical and Civil Engineering
7.	Dr. Ranchan Chauhan	Assistant Professor	School of Mechanical and Civil Engineering
8.	Dr Atul Pandey	Associate Professor	School of Mechanical and Civil Engineering
9.	Dr. Alok Darshan Kotiyal	Assistant Professor	School of Mechanical and Civil Engineering
10.	Er Robin Thakur	Assistant Professor	School of Mechanical and Civil Engineering
11.	Dr. Deepak Kapoor	Assistant Professor	School of Pharmaceutical sciences
12.	Dr Rakesh Shukla	Assistant Professor	School of Business Management and Liberal Arts
13.	Dr. Kuldeep Rojhe	Associate Professor	School of Business Management and Liberal Arts
14.	Dr. Radhey Shayam	Assistant Professor	School of Physics and Material Science

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

The following Professor of Eminence and Visiting Professor are involved in various academic activities of the School:

Table SBFT07: List of Emeritus Professors, Visiting Faculty and Adjunct Faculty for School of Bioengineering and Food Technology.

S. No.	Category	Name	Designation & Organisation
1.	Professor of Eminence	Prof. Manoranjan Kalia	Retired Professor, CSKHPKV, Palampur
2.	Professor of Eminence	Prof. Umesh Kumar Kohli	Retired Professor, Dr. YS Parmar University of Horticulture and Forestry, Nauni, Solan
3.	Visiting Professor	Prof. B.B. Lal Kaushal	Retired Professor, Dr. YS Parmar University of Horticulture and Forestry, Nauni, Solan

13. Percentage of classes taken by temporary faculty–program-wise information: Nil

14. Program-wise Student Teacher Ratio

The following is the list of program wise student teacher ratio in the School:

Table SBFT08: List of program –wise student teacher ratio

S.No.	Program	Student teacher ratio
1.	B.Tech. Biotechnology/Food Technology	14.5:1
2.	M.Sc. Food Technology	5:1
3.	M.Tech. / Dual Degree in Food Technology	10:1

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

The following administrative and academic support staff (technical) is assisting School in running different programs:

Table SBFT09: List of Academic support and administrative staff

Staff	Sanctioned	Filled	Actual (including CAS & MPS)
Technical staff	Nil	Nil	Nil
Lab Attendants	4	4	4
Administrative staff	1	1	1

16. Research thrust areas as recognized by major funding agencies

The School is focusing its research on sustainable utilization and conservation of Himalayan biodiversity. The major thrust areas of the School are utilization of wild fruits from Himalayan region of Himachal Pradesh; Biosensor technology for food items and human diseases and fortified food development for micronutrient deficient diets. To promote the global competencies of the students the international research and ethical standards are followed by the School.

Following are the major thrust areas of research undertaken by the faculty members:

Food Fermentation and Nutrition Science

- Production of probiotic and nutraceutical food products.
- Corn flour: a versatile substrate for zein, xanthophylls extraction and alcoholic beverage production.
- Red yeast (*Monascus purpureus*) fermented rice for production of anti-cholesterol metabolite Lovastatin (monacolin K).

Microbial enzyme technology, bioremediation and industrial biotechnology

- Enzyme mediated synthesis, scale up and downstream processing of important industrial chemicals like benzoic acid, acrylamide, benzoic acid and D-Lactamide.
- Bioremediation of toxic nitrile compounds (cyanide group containing compounds) using microbial enzymes like nitrilase, nitrile hydratase and amidase
- Cloning and expression of thermostable and alkaline protease gene from *Bacillus* sp. and its fermenter scale up and application in photographic waste recycling.

- Generation of cost-effective biofertilizer/ biocontrol/bioremediant in crop improvement and organic farming.

Fruit and Vegetable Technology

- Development of low cost technologies for fruit and vegetables grown in Northern Himalayan region.
- Development of Technology for Preparation of Functional Wine from *Diospyros kaki* (Persimmon Fruits).
- Utilization of Millets for development of Probiotic rich Millet Milk beverage.

Biosensor Technology

- *speB* gene as a specific genetic marker for early detection of rheumatic heart disease in human.
- Biosensor technology for diagnosis of human and food pathogens
- Development of genosensors for human pathogens.
- Developing diagnostic protocols for functional foods.

Nanotechnology in Food Industry

- Application of nanotechnology in food science.
- Use of nanoparticles for developing fast and accurate colorimetric methods for detection of food adulteration.
- Nano-encapsulation of functional food ingredients and incorporating in different products for better bioavailability.

Fortified food development

- Micronutrients fortification to combat the problem of deficiency disease.
- Developing the functional dairy products.
- Optimization of procedures for developing fermented dairy products.

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

a) National Projects

Number of Faculty with ongoing projects: 4

Within a short span of 5 years, most of the faculty members have their own externally funded research projects. Following are the projects granted by different funding agencies to the faculty members of the School:

Table SBFT10: List of faculty R&D projects granted by different funding agencies

S. No.	Title of the Project	Investigator	Funding agency	Year	Amount (lakh)
1.	Process optimization for recovery and purification of Zein and xanthophyll's (resp. valuable maize proteins and pigments) and its stability application in food products.	Dr. Dinesh Kumar (PI) & Dr. Somesh Sharma (Co-PI)	DBT	2013-16	16.20
2.	Isolation, Optimization and cloning of nitrilase of thermophilic isolate from hot springs of Himachal Pradesh and its application in mandelic acid synthesis.	Dr. Amit Seth (PI)	DST	2013-16	18.00
3.	Utilization of Wild Himalayan Fig for the sustainable livelihood of weaker sections of the society in mid hill region of Himachal Pradesh.	Dr. Somesh Sharma (PI) & Dr. Pankaj Kumar Chauhan (Co-PI)	DST	2014-17	18.55
4.	Identification of genes conferring beneficial bio fertilizer and biocontrol activities in plant-growth-promoting rhizobacteria (PGPR) for crop improvement	Dr. Adesh K Saini (PI)	DST	2013-16	23.4

b) International Projects: Nil

c) Total grants received: Rs.76.15 Lakhs

18. Inter-institutional collaborative projects and associated grants received

a) **National collaboration:** Nil

b) **International collaboration:** 01 (Dr. Adesh K. Saini)

Table SBFT11: Details of International research project

Faculty (PI)	Sponsoring Agency	Title of project	Rs. (lakhs)	Period	Collaborating Institutes
Dr. Adesh Saini	Indo New Zealand project by DST-MBIE	Testing for the Efficacy of Functional Foods: Collaborative Development of an Assay to Determine impacts of Foods on Antioxidant Activity	64.80	2013-15	Shoolini University; Prof. Christine Winterbourn, University of Otago, ChristChurch, Newzealand ; Dr. Vikas Kumar, Center for Cellular and Molecular Platforms (CCMP), Bangalore

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

The following two projects have been sanctioned by the Ministry of Food Processing Industry (MoFPI), Govt. of India, New Delhi to the School for the creation of infrastructure facilities for B.Tech Food Technology program and also for creation of commercial food testing laboratory with high ended testing equipments.

Table SBFT12: List of infrastructure creation projects funded by different agencies

a) **Sanctioned Project**

S.No.	Title of the Project	Funding agency	Amount (lakh)
1.	Infrastructure Creation for B.Tech Food Technology under HRD scheme	MoFPI	73.71

b) Sanctioned Project recommended for funding

S.No.	Title of the Project	Funding agency	Amount
1.	Creation of Food Testing Laboratory (letter received, Grant to be released)	MoFPI	Approx. 3 crore

Total grant received under point number 17 +18 +19(a) = Rs. 214.66 lakh

20. Research facility / centre with

state recognition: Nil

national recognition

A commercial food testing laboratory has been approved by the Ministry of Food Processing Industry (MoFPI), New Delhi to be set up in the campus of Shoolini University. This will cater to the testing and food labeling needs of the commercial and non commercial industries located in Himachal Pradesh and adjoining states. The grant for the same is yet to be released by the MoFPI.

international recognition: Nil

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

22. Publications:

Number of papers published in peer reviewed journals	: 41
Monographs	: Nil
Chapters in Books	: 12
Books Edited	: Nil
Books with ISBN with details of publishers	: 2
Number listed in International Database	: 25
Citation Index (average /range)	: 2/ (0-5)
SNIP (Source Normalized Impact per Paper)	: -
SJR (Scientific Journal Ranking)	: -

Impact Factor (average) : 1.65

h-index : 02

Number of papers published in peer reviewed journals: 35

1. Chandan P, Sharma I, Kumar D, Production of a thermostable and alkaline Protease by *Bacillus Subtilis* MTCC 9226. **Res. J. Biotech.** 2011, **6(2)**:44-48. (IF 0.284)
2. Shirkot S, Poonam and Kumar D. Assessment of genetic diversity of *Indigofera pulchella* in Himachal Pradesh using isozyme markers. **Ind. J. Hort.** 2011, **68(3)**: 386-393. (IF 0.11)
3. Kaushal A, Goyal L, Kumar A. Recent Advances in Diagnosis of Rheumatic Heart Disease. **Biosci. Biotech. Res. Commun.** 2011, **4(1)**:1-9
4. Pratush A, Seth A, Bhalla TC. (2011). Optimization of process parameters for conversion of 3-cyanopyridine to nicotinamide using resting cells of mutant 4D strain of *Rhodococcus rhodochrous* PA-34. **Int. J. Bioautomation.** 2011, **15 (3)**: 151-158.
5. Pratush A, Sharma M, Seth A, Bhalla TC. Seeds of rosary pea, *Abrus precatorius*: A novel source of hydroxynitrile lyase. **J. Biochem. Tech.,** 2011. **3 (2)**: 274-279.
6. Pratush A, Seth A, Bhalla TC. Cloning, Sequencing, and Expression of Nitrile hydratase Gene of Mutant 4D Strain of *Rhodococcus rhodochrous* PA 34 in E. coli. **Appl. Biochem. Biotechnol.** 2012. **168**: 465-486.
7. Verma R, Parkash V, Kumar D. Ethnomedicinal uses of some plants of Kanag Hill in Shimla, Himachal Pradesh, India. **Int. J. Res. Ayur Pharma.** 2012, **3(2)**: 319-322.
8. Thakur S, Kumar N, Kumar D, Bhalla TC. Microbiological and biochemical characterization of seera: a traditional fermented food of Himachal Pradesh. **Int. J. Food Ferment. Technol.** 2012, **2(1)**: 49-56.
9. Kaushal A, Kumar D, Khare S, Kumar A. *speB* gene as a genetic marker for early detection of rheumatic heart disease in humans. **Cell Mol. Biol.** 2012, **58(1)**:50-54. (IF 1.46)
10. Pratush A, Seth A, Bhalla TC. Purification and characterisation of nitrile hydratase of mutant 4D *Rhodococcus rhodochrous* PA-34. **Biotech.** 2013, **3 (2)**: 165–171.
11. Kaushal A, Kumar D, Khare S, Kumar A. New genetic marker for rheumatic heart disease. **Nat. Ind.** 2013, DOI: 10. 1038/nindia. 2013.3
12. Kaur M, Sandhu KS, Ahlawat RP, Sharma S. Invitro starch digestibility, pasting and textural properties of mung bean : Effect

- of different processing methods. *J. Food Sci. Tech.* 2013, DOI10.1007/s13197-013-1136-2 (IF 2.024)
13. Saini AK, Chauhan PK, Singh V, Sharma P. Phytochemical, Antioxidant & *in vitro* Antibacterial Activity of Aqueous & Ethanolic Fruit Extracts of *Kigelia Africana*. *Ind. J. Pharm. Biol. Res.* 2013. **1(2)**:46-52.
 14. Chauhan PK, Singh RV, Abhishek B. Comparative study of Lipid Profile and level of Antioxidant enzymes in Cigarette smokers with Non-Cigarette smokers. *Ind. J. Pharm. Biol. Res.* 2013, **1 (1)**: 55-62.
 15. Kumar D, Kumar A, Guleria A, Kumari A. Isolation, immobilization and characterization of xylanase from anew isolate *Bacillus atrophaeus* E8. *Int. J. Sci. Res.* 2014, **3(2)**: 33-36. (IF 2.19)
 16. Kumar A, Singh S, Kumar D. Evaluation of antimicrobial potential of cadmium sulphide nanoparticles against bacterial pathogens. *Int. J. Pharma. Sci. Rev. Res.* 2014, **24(2)**: 204-206. (IF 2.19)
 17. Chauhan PK, Singh S, Kour J, Singh M, Need of Conservation & Management of Endangered plant species of North Western Himalayas- A Review. *World J. Pharma. Res.* 2014, **3(9)**: 222-226. (IF 5.054)
 18. Bhardwaj VS, Kumar Munish, Chauhan PK, Tyagi A, Thakur K. To check the prevalence and the antibiotics susceptibility of *Salmonella* isolated from diarrheal patients in Paonta Sahib, HP. *Int. J. Pharm. Integ. Life Sci.* 2014, **2(10)**: 37-46. (IF 1.04)
 19. Chauhan PK, Sharma S, Chandrika H, Mansi. Evaluation of Phytochemical and *In-Vitro* Antioxidant and Antibacterial Activities of Wild Plant Species of *Bauhinia* and *Ficus* of HP. *World J. Pharma Pharmaceut. Sci.* 2014, **3(4)**: 659-668. (IF 0.8)
 20. Sharma P, Shah GC, Dhami DS, Chauhan PK, Singh V. Chemical Composition, Antibacterial and Antioxidant Activities of *Senecio Laetus* Edgew. from cold desert of Western Himalaya. *Int. J. Pharma. Res. Bio-Sci.* 2014, **3(1)**: 188-199.
 21. Kaushik R, Swami N, Sihag M, Ray A. Isolation, characterization of wheat gluten and its regeneration properties. *J.Food Sci. Tech.* 2014, -DOI 10.1007/s13197-014-1690-2. (IF 2.024)
 22. Singh S, Kaushal A, Khare S, Kumar P, Kumar A. Gold–mercaptopropionic acid–polyethylenimine composite based DNA sensor for early detection of rheumatic heart disease. *Analyst.* 2014, **139**: 3600-3606. (IF 0.8)
 23. Singh S, Kaushal A, Khare S, Kumar A, mga Genosensor for Early Detection of Human Rheumatic Heart Disease. *Appl. Biochem.*

- Biotechnol.** 2014, **173**:228–238.
24. Sachdeva B, Kaushik R, Arora S. Impact of fortification with iron salts and vitamin A on the physico-chemical properties of laboratory pasteurized toned milk and bioaccessibility of the added nutrients. **Int. J. Dairy Tech.** 2014, DOI: 10.1111/1471-0307.12185 (IF 1.1)
 25. Sachdeva B, Kaushik R, Arora S. Bioavailability of iron in multiple fortified milk. **J. Food Sci. Tech.** 2014, DOI 10.1007/s13197-015-1711-9. 2014 (IF 2.024)
 26. Janghu S, Kaushik R, Bansal V, Sharma P, Dhindwal S. Physicochemical analysis of ghee residue and conversion into confectionary food products. **Ind. J. Dairy Sci.** 2014, **67(4)**: 216-219.
 27. Janghu S, Ray A, Bansal V, Kaushik R. Dehydration process optimization for maximum lycopene retention in tomato slices using response surface methodology”. **Asian J. Dairy Food Res.** 2014, **33(3)**, 111-116.
 28. Thakur AD, Saklani A, Sharma S, Joshi VK. Effect of Different Sugar Sources, Pectin esterase and acidulant Concentrations on Pumpkin Wine Production. **Int. J. Food Ferment. Technol.** 2014, **4(1)**: 67-78.
 29. Kaushal A, Kumar D, Khare S, Kumar A. New genetic marker for rheumatic heart disease. **Nat. Ind.** 2013, DOI: 10. 1038/nindia. 2013.3
 30. Kaur M, Sandhu KS, Ahlawat RP, Sharma S. Invitro starch digestibility, pasting and textural properties of mung bean : Effect of different processing methods. **J. Food Sci. Tech.** 2013, DOI10.1007/s13197-013-1136-2 (IF 2.024)
 31. Saini AK, Chauhan PK, Singh V, Sharma P. Phytochemical, Antioxidant & *in vitro* Antibacterial Activity of Aqueous & Ethanolic Fruit Extracts of *Kigelia Africana*. **Ind. J. Pharm. Biol. Res.** 2013, **1(2)**:46-52.
 32. Chauhan PK, Singh RV, Abhishek B. Comparative study of Lipid Profile and level of Antioxidant enzymes in Cigarette smokers with Non-Cigarette smokers. **Ind. J. Pharm. Biol. Res.** 2013, **1 (1)**: 55-62.
 33. Kumar A, Kumar D. Characterization of *Lactobacillus* isolated from dairy samples for probiotic properties. **Anaerobe.** 2015, **33**:117-123. (IF 2.7)
 34. Chauhan S, Seth CA, Seth A. Bioprospecting thermophilic microorganisms from hot springs of western himalyas for xylanase production and its statistical optimization by using response surface

- methodology. *J Pure Appl. Micro.* 2015, Accepted for publication/In press. 28 pp.
35. Kumar V, Seth A, Kumari V, Kumar V, Bhalla TC. Purification, characterization and in-silico analysis of nitrilase from *Gordonia terrae*. *Protein Peptide Lett.* 2015, **22(1)**: 52-62
 36. Chaudhary R, Singh B, Kumar M, Gakhar SK, Saini AK, Parmar VS and Chhillar AK Role of single nucleotide polymorphisms in Pharmaco-genomics and their association with human disease. *Drug and Metabolism Review* 2015 (Accepted) (IF 6.286)
 37. Dong J, Munoz A, Kolitz SE, Saini AK, Chiu WL, Rahman H, Lorsch JR and Hinnebusch AG. Conserved residues in yeast initiator tRNA calibrate initiation accuracy by regulating preinitiation complex stability at the start codon. *Genes and Development* 2014, **28**:502-520.(IF 12.64)
 38. Gupta D, Singh D, Kothiyal NC, Saini AK, Singh VP and Pathania D. Synthesis of chitosan-g-poly(acrylamide)/ZnS nanocomposite for controlled drug delivery and antimicrobial activity. *International Journal of Biological Macromolecules* 2015, **74C**:547-555. (IF 3.10)
 39. Saini AK, Chauhan PK, Singh V and Sharma P. Phytochemical, antioxidant & in vitro antibacterial activity of aqueous & ethanolic fruit extracts of *Kigelia Africana*. *Indian Journal of Pharmaceutical and Biological Research* 2013, **1(2)**:46-52
 40. Saini AK, Nanda JS, Martin-Marcos P, Dong J, Zhang F, Bhardwaj M, Lorsch JR and Hinnebusch AG. Eukaryotic translation initiation factor eIF5 promotes the accuracy of start codon recognition by regulating Pi release and conformational transitions of the preinitiation complex. *Nucleic Acids Res.* **2014**, **42**:9623-9640. (IF 8.37)
 41. Zhang F, Saini AK, Shin BS, Nanda JS and Hinnebusch AG. Conformational changes in the P site and mRNA entry channel evoked by AUG recognition in yeast translation preinitiation complexes. *Nucleic Acids Res.* 2015, **43**:2293-2312. (IF 8.37)

Chapters in Books: 12

1. Bhalla TC, Kumar D. Application of enzymes in food processing. *In: Food Processing : Biotechnological applications*. Marwah SS and Arora JK. Asiatech Publishers Inc. New Delhi. **2000**. pp. 123-141 ISBN: 81-87680-04-0.

2. Bhatt A, Bhushan S, Sharma S. Preserves, Candies, Crystallized Fruits and Vegetables. ***In: Postharvest Technology of Fruits and Vegetables.*** Verma LR and Joshi VK (Eds). **2000.** pp. 720-741 The Indus Publ., New Delhi ISBN No: 81-7387-108-6.
3. Joshi VK, Sharma S, Bhushan S, Attri D. Fruit-Based alcoholic beverages. ***In: Concise Encyclopedia of Bioresource Technology.*** Pandey, Ashok (Editor) Haworth Inc Press, New York. **2004,** pp.335-345 ISBN No: ISBN 1-56022-980-2.
4. Joshi VK, Sharma S. Cider Vinegar. ***In: Vinegars of the world.*** Paolo Giudici and Lisa Solieri (Eds), Italy. **2008,** pp.197-207 ISBN No: 978-88-470-0865-6.
5. Joshi VK, Sharma S, Parmar M. Cider and Perry. ***In: Hand Book of Enology Principles, Practices and Recent Innovations.*** Joshi V.K (Editor) Asia Tech Publ. Co., New Delhi. **2011.** pp. 1116-1147 ISBN No: 8187680245.
6. Bhushan S, Sharma S. The maturation of wines and Brandies. ***In: Hand Book of Enology Principles, Practices and Recent Innovations.*** Joshi V.K (Editor) Asia Tech Publ. Co., New Delhi. **2011,** pp.861-900. ISBN No: 8187680245.
7. Joshi VK, Sharma S, Rana VS. Wine and Brandy. ***In: Food Biotechnology: Principles and Practices.*** Joshi, V.K. and Singh, R.S.(Eds). IK International Publishing House, Pvt Ltd. New Delhi. **2011,** pp 471-494. ISBN No: 9381141495
8. Sharma S, Joshi VK, Thakur NS. Lactic acid fermented foods. ***In: Food Biotechnology: Principles and Practices.*** Joshi, V.K. and Singh, R.S.(Eds). IK International Publishing House, Pvt Ltd. New Delhi. **2011,** pp. 375-415. ISBN No: 9381141495.
9. Sharma SK, Joshi VK, Sharma S. Probiotics: Concepts and applications in food. ***In: Food Biotechnology: Principles and Practices.*** Joshi, V.K. and Singh, R.S.(Eds). IK International Publishing House, Pvt Ltd. New Delhi. **2011,** pp. 781-798. ISBN No: 9381141495
10. Kumar N, Seth R, Pathera AK. Nanotechnology for food security. ***In: Emerging Science and Technology for Food, Environment and Agriculture.*** Agrobios (International) Publisher, Jodhpur. **2012,** pp. 551-559 ISBN: 978-93-81191-01-9.
11. Seth A, Seth Attri C. A strategy for chemical and biological disaster risk reduction. ***In: Disaster Management and Economic Development.*** Kapoor G. P. Eds.. APH Publishing Corp. **2012.** pp.295-298 ISBN 978-93-313-1740-7.

12. Pathera A K, Kumar N, Saini P, Kumar M. Microbial spoilage of muscle food and related consumer health safety aspects. ***In: Microbial, Plant and Animal Research***. Nova Science Publishers, NY, USA. Inc. **2013**, pp.551-558 ISBN: 978-1-62618-610-1.

Books with ISBN with details of publishers: 2

1. Kumar D, Mehra P. **2012. Instrumental Methods of Analysis in Biotechnology**. I.K. International Publishing House Pvt Ltd., New Delhi, ISBN No: 978-93-81141-38-0.
2. **Chauhan PK. 2012. Harmful Effects of Cigarette Smoking & Alcohol Consumption- A Clinical Study**. Lap Lambert. Academic Publishing, Germany, ISBN No. 978-3-459-14642-8.

23. Details of patents and income generated

Following is the list of granted and filed patents of the School:

Table SBFT13: List of patents filed and granted under the School

S.No.	Title of the patent	Inventors	Patent filing no
1.	An Antibacterial formulation against VRSA, Published in official patent Journal on 09-08-13	Dr. Pankaj Chauhan	Application No-Temp/6548/DEL/2012 (Patent granted)
2.	Novel, Microbe Producing Xylanase and Method of Enzyme Production thereof	Dr. Amit Seth	TEMP/E-1/18349/2015-DEL(Patent Filed)

24. Areas of consultancy and income generated

A project was undertaken by School of Bioengineering and Food Technology with Himachal Pradesh Horticultural Produce Marketing and Processing Corporation limited (HPMC) (A Govt. Undertaking) for providing consultancy services on up gradation of the existing facilities of HPMC to make them at par with International standards. Besides this, the scientists of the School have provided technical input for the improvement of existing products and development of some new products suited to market for HPMC.

Income generated from HPMC consultancy project: 2 lakh

25. Faculty selected nationally / internationally to visit other laboratories / institutions / industries in India and abroad

a) National Visits

- Dr Dinesh Kumar delivered an invited lecture on Biocatalytic Biosensors and Applications in UGC sponsored National conference on Biocatalysis and Biotransformation at Department of Biotechnology, HP University, Shimla on 27 October, 2012.
- Dr Dinesh Kumar delivered plenary lecture on Microbial Proteases and their biotechnological applications in International conference on New Horizons in microbial biotechnology and pharmaceutical sciences at Himachal Institute of life Sciences, Paonta Sahib, Himachal Pradesh on 24-25th April, 2011.
- Dr Dinesh Kumar participated and chaired session as resource person in ICMR sponsored National Workshop –cum-training program on Standardization of Medicinal plants and their products at Shoolini University, Solan on 22-24th March, 2015.
- Dr Adesh K Saini under DST-New Zealand project to visit Univ of Otago, New Zealand.

b) International Visits

- Dr Dinesh Kumar visited France for oral presentation on Immobilization of invertase produced by a new isolate *Saccharomyces* sp. in XIXth International Conference on Bioencapsulation, Amboise, France, 5-8 October, 2011.
- Er. Ankur Kaushal visited Spain for poster presentation on Electrochemical DNA sensor for early diagnosis of Rheumatic heart disease. 3rd International Conference on Bio-Sensing Technology, Sietage, Spain on 12-15 May, 2013.

26. Faculty serving in

a) National committees

Table SBFT14: List of faculty members serving in National Committees

S. No.	Faculty Name	Committee
1.	Dr. Dinesh Kumar	Member of Board of Studies (Microbiology) in Himachal Pradesh University, Shimla

b) International committees: Nil

c) Editorial Boards

Table SBFT15: List of faculty members serving in Editorial Boards

S. No.	Faculty Name	Journal Name
1.	Dr. Dinesh Kumar	1. American Journal of Food Science and Nutrition 2. Journal on New Biological Reports 3. Biological Forum – An International Journal 4. Indian Journal of Fundamental and Applied Sciences 5. International Journal of Food Agriculture and Veterinary Sciences
2.	Dr. Somesh Sharma	1. International Journal of food Fermentation Technology
3.	Dr Pankaj Kumar Chauhan	1. Scientific India Magazine 2. Indian Journal of Pharmaceutical and Biological Research 3. International Journal of Pharmaceutical and Medicinal Research

d) any other (please specify)

The following faculty members are reviewers of journals listed in scopus:

Table SBFT16: List of faculty serving as reviewers of journals

S.No.	Name	Journals enlisted in Scopus
1.	Dr. Dinesh Kumar	American Journal of Food Science and Nutrition
2.	Dr. Somesh Sharma	Journal of Food Science and Technology
3.	Dr Ravinder Kaushik	Food Chemistry
		Journal of Agricultural and Food Chemistry
		Food Bioprocess technology
		Journal of Food Science and Technology
		Cereal Chemistry

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

Faculty members from the School of Bioengineering and Food Technology have actively participated and presented their research work in various refresher courses, conferences, workshops, orientation and training programs organized by different national and international organizations. Following is the list of different programs attended by our faculty:

Orientation Programs:

- Dr. Pankaj Chauhan, Dr. Somesh Sharma, Er. Shallini Jaggi, Dr. Naveen Kumar, Dr. Ravinder Kaushik and Mr. Rahul attended Faculty Development Program organized by the Shoolini University.

Workshops/ conferences attended and papers presented

Following is the list of faculty members who have attended various workshops/conferences:

1. Sandhu KS, Kaur M, Bala S, and Sharma S. 2012. *In vitro* starch digestibility, pasting and textural properties of mung bean as affected by different processing methods. In: XX1 Indian convention of Food Scientists and Technologist (IFCOST).on 20-21 January 2012, Pune, India.
2. Dogra P, Kumar D, Saini AK, Bhalla TC. 2013. Isolation of *Monascus purpureus* from fermented rice and its screening for *Lovastatin monacolin K*) production under solid state fermentation. Biologic 13, National symposium on role of biotechnology in infectious diseases, on 7-8 March, 2013, Beehive College of Advanced Studies, Dehradun, UK.
3. Pandey S, Kumar D, Seth A, Bhalla TC. 2013. Isolation and screening of bacterial cultures for production of L-asparaginase (an antitumour agent), Biologic 13, National symposium on role of biotechnology in infectious diseases, on 7-8 March, 2013, Beehive College of Advanced Studies, Dehradun, UK.
4. Sharma N, Pandey S, Soni NK, Kumar D. 2013. Biotyping, serotyping and antimicrobial susceptibility pattern of *E.coli* isolates from urinary tract infection. Biologic 13, National symposium on role of biotechnology in infectious diseases, on 7-8 March, 2013, Beehive College of Advanced Studies, Dehradun, UK.
5. Kumar A, Singh S, Kumar D. 2013. Evaluation and antimicrobial potential of CdS nanoparticles against multidrug-resistant bacterial pathogens. Biologic 13, National symposium on role of biotechnology

- in infectious diseases, on 7-8 March, 2013, Beehive College of Advanced Studies, Dehradun, UK .
6. Thakur N, Gupta P, Kumar D, Sharma S. 2013. Production and evaluation of wine from different varieties of rice and red yeast rice using *Saccharomyces spp.* culture. 1st Annual National Conference, science: Emerging Scenario & Future Challenges, on 8-10 March, 2013 by Him Science congress Association at Shoolini University, Solan.
 7. Sharma M, Seth CA, Seth A. 2015. Isolation and screening of thermo-tolerant bacterial strain for nitrilase production. National Conference on advances in Agricultural Sciences, organised by DAV College, on 28 February, 2015 at DAV College Jalandhar, Punjab.
 8. Thakur AS, Seth CA, Bhalla TC, Seth A. 2012. Isolation and optimization of cellulase production by thermophilic bacteria TPS 4 from Tattapani hot spring of Himachal Pradesh. In: International Conference on Microbial World: Recent Innovations and Future Trends, organised by Association of Microbiologists of India (AMI) and Kalinga Institute of Industrial Technology (KIIT) University, 22-25 November, at Bhubaneswar, Odisha, India.
 9. Seth A, Seth CA. 2012. A strategy for chemical and biological disaster risk reduction. In: Disaster Management and Economic Development. In: National Seminar on Impacts of Disasters on Economic Development, organised by Disaster Management Centre, HIPA, on 5th May, 2012, at Disaster Management Centre, HIPA, Fairlawns, Shimla.
 10. Seth CA, Seth A, Bhalla TC. 2012. Process optimization for the conversion of 3-cynopyridine to nicotinic acid using resting cells of *Rhodococcus rhodochrous*. In: National Seminar on Plant Biodiversity: Retrospect & Prospects, organised by Department of Botany, Government Post Graduate College, Dharamshala, on 25-26 February 2012, at Government Post Graduate College, Dharamshala, District Kangra (H.P.).
 11. Seth A, Seth CA, Bhalla TC. 2012. Purification and characterization of nitrilase of *Gordonia terrae*. In: National Seminar on Plant Biodiversity: Retrospect & Prospects, organised by Department of Botany, Government Post Graduate College, Dharamshala, on 25-26 February, at Department of Botany, Government Post Graduate College, Dharamshala, District Kangra (H.P.).
 12. Kumar D. 2013. Preconference international workshop and Satellite symposium on entrepreneurship development during platinum jubilee celebration on 17-20 Nov, 2013, at Maharshi Dayanand University, Rohtak, Haryana, India.
 13. Sharma S. Intellectual property rights. In : “IP-Connect” :A workshop

- on Intellectual property rights, organised by IP cell, on 3rd August 2013, Jaypee University of information technology, Wanknaghat, Solan, Himachal Pradesh.
14. Kumar D. Delhi Sustainable Development Summit Special Event on Water: Our Global Common organised by The Energy and Resources Institute (TERI) and the Flemish Institute for Technological Research (VITO), on 31st January 2012, at the India Habitat Centre, New Delhi, India.
 15. Kumar D. 1st Annual National Conference, science: Emerging Scenario & Future Challenges Organised by Him Science congress Association, on 8-10 March 2013, at Shoolini University, Himachal Pradesh.
 16. Kumar D. Research trends in Future drug development: Exploration of Medicinal and Aromatic Flora, organized by School of Pharmaceutical Sciences, Shoolini University & ICMR, Govt. of India, on 20-21 June, 2013 at Shoolini University.
 17. Sharma S. Studies on evaluation of Indigenous fermented Persimmon products. In: Sixth International conference on fermented foods, Health status and social well being: Challenges and Opportunities, organized by Anand Agriculture University, on 15-16 December, 2013, at AAU, Anand, Gujarat, India,
 18. Sharma S. National Conference in Food Technology: Emerging Trends (NCFT-2015), organized by Department of Food Science and Technology, on 24-25 March 2015, at Chaudhary Devilal University, Sirsa Haryana,.
 19. Kumar N. National Conference in Food Technology: Emerging Trends (NCFT-2015), organized by Department of Food Science and Technology, on 24-25 March 2015, at Chaudhary Devilal University, Sirsa Haryana,.
 20. Thory R. National Conference in Food Technology: Emerging Trends (NCFT-2015), organized by Department of Food Science and Technology, on 24-25 March 2015, at Chaudhary Devilal University, Sirsa Haryana,
 21. Sharma S. Fifth International conference on fermented foods, Health status and social well being: Challenges and Opportunities, organized by CFTRI, on 15-16 December 2011 at CFTRI, Mysore.
 22. Seth, A. International Conference on Microbial World: Recent Innovations and Future Trends, organized by Association of Microbiologists of India (AMI) and Kalinga Institute of Industrial Technology (KIIT) University, from 22-25 November, 2012, at Bhubaneswar-24, Odisha, India.
 23. Seth A. National Seminar on Impacts of Disasters on Economic

Development, organised by Disaster Management Centre, HIPA, on 5th May, 2012 at Disaster Management Centre, HIPA, Fairlawns, Shimla.

24. Seth, A. National Seminar on Plant Biodiversity: Retrospect & Prospects, organised by Department of Botany, Govt. Post Graduate College, Dharamshala, on 25-26 February 2012, at Govt. Post Graduate College, Dharamshala, District Kangra.

28. Student projects

- percentage of students doing in house projects including interdepartmental projects: 90%
- percentage of students doing projects in collaboration with other universities / industry / institute: 10%

Table SBFT17: List of students with Project/Research as mandatory course

No. of Programs with Students Project/ research as mandatory course	Percentage	Number of projects Executed
B.Tech Food Technology	100	26
B.Tech Biotechnology	100	180
M.Tech Food Technology	100	5
Dual Degree in Food Technology	100	5
M.Sc. Food Technology	100	Nil
Ph.D Food Technology	100	Nil

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

Table SBFT18: List of faculty members received awards / recognitions

S. No.	Faculty Name	Award/Recognition
1.	Dr Ravinder Kaushik	Certificate of Appreciation for outstanding research during Ph.D from NDRI, Karnal
2.	Dr Amit Seth	Certificate of Merit at National Conference on Modern Approaches to Pteridophytes: Biology, Biodiversity and Bioresource held at CSIR-Institute of Himalayan Bioresource Technology, Palampur, 20-21 December, 2014.
3.	Dr Dinesh Kumar	Travel Grant from Shoolini University for oral presentation in XIX th International Conference on Bioencapsulation, Amboise, France, 5-8 October, 2011
4.	Er. Ankur Kaushal	Travel Grant from DST for presenting poster in 3 rd International Conference on Bio-Sensing Technology, Sietage, Spain on 12-15 May, 2013

Doctoral / Post doctoral fellows

Nil. The Ph.D program in the School of Bioengineering and Food Technology was started in the year 2014

PG Students: Nil

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

The following is the list of Seminars/ Conferences/Workshops jointly organized by the faculty members of School of Bioengineering and food Technology and School of Biotechnology:

Table SBFT19: List of Seminars/ Conferences/Workshops organized

S.No.	Title	Funding agency	Date
1.	Training cum seminar on Molecular Biology techniques for college lecturers	DBT	November 10-19, 2011
2.	Fascination of Plants Day in collaboration with European Plant Science Organization (EPSO) for creating awareness amongst the science students towards environment and its value for the human society	Shoolini University	18 May 2012 & 17 May 2013) funded by Shoolini University.
3.	Awareness program for farmers on Protection of Plant Varieties and Farmers Rights	PPV&FRA, Ministry of Agriculture	February 19, 2013

31. Code of ethics for research followed by the departments

The Joint Research and Development Committee (JRDAC) of Shoolini University provides direction for the research agenda of the Shoolini University and also looks after the progress of externally funded research projects through regular meetings and progress presentations. The School level committee looks after the research projects taken up by the students at UG/PG/Ph.D. level through progress presentations from time to time. Pre thesis seminar is conducted for every PG/Ph.D. research and candidates who successfully

defends their research work before the School level committee is allowed to submit the thesis.

For animal based studies an ethical committee has been constituted by the University. All research projects involving pathogenic microorganisms and animals require ethical committee clearance to start their research work.

32. Student profile program-wise:

Table SBFT20: Program-wise pass percentage of B. Tech, M. Tech and Ph.D. students

Course Name	Year	Name of the Program	Applications received	Selected		Pass percentage	
				Male	Female	Male	Female
B.Tech.	2009-13*	Biotech.	31	19	11	90	100
	2010-14*		101	52	42	85	98
	2011-15		67	34	31	90	94
	2012-16		75	25	23	-	-
	2013-17		60	27	31	-	-
	2014-18		77	24	37	-	-
	2010-14*	Food Tech.	13	6	7	85	100
	2011-15		13	5	8	100	78
	2012-16		33	13	20	-	-
	2013-17		50	19	25	-	-
	2014-18		40	20	12	-	-
M.Tech.	2013-15	Food Tech.	5	1	4	100	100
	2010-15	Dual Degree Food Tech	5	1	4	100	100
M.Sc.	2014-16	Food Tech.	5	2	3	-	-
Ph.D.	2014-17	Food Tech.	3	3	0	-	-

* These Batches have already passed out.

33. Diversity of students

Table SBFT21: Program-wise pass percentage of B. Tech, M. Tech and Ph.D. students

Name of the Program and Batch	% of Students from the Same University	% of students from other universities	% of students From Universities	% of students from other countries
		within the State	outside the State	
B. Tech. Food Technology*	Nil	Nil	Nil	Nil
B.Tech. Biotechnology*	Nil	Nil	Nil	1
M.Tech Food Technology 2013-15	Nil	60	40	Nil
Dual Degree Food Technology 2010-15	100	Nil	Nil	Nil
M.Sc Food Technology 2014-16	Nil	20	80	Nil
Ph.D. Food Technology 2014-17	100	Nil	Nil	Nil

* In B.Tech Program students enters in the University after 10+2 level.

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

Table SBFT22: List of students cleared competitive examinations

S.No.	Name of the fellowship	No. of students qualified	Name of the Students	Batch/Session
1.	ARS-NET	2	Dinesh Kumar, Anshul Sharma	2009-13 2009-13
2.	GATE	5	Divyanshu Nautyal	2009-13
			Dinesh Kumar	2009-13
			Mamta Kumari	2009-13
			Rashmi Rathour	2009-13
			Mehandi Goyal	2011-15
			Aroshi Sharma	2010-14
3.	GRE	1	Yogender Verma	2010-14
4.	TOEFL	1	Yogender Verma	2010-14

- 35. Student progression within Shoolini University**

Table SBFT23: Data for student progression within university

Student progression	Percentage against enrolled
UG to PG	10%
PG to M.Phil.	Nil
PG to Ph.D.	5%
Ph.D. to Post-Doctoral	Nil
Employed	
Campus selection	75%
Other than campus recruitment	24%
Entrepreneurs	1%

36. Diversity of staff

Table SBFT24: Diversity of staff

Percentage of faculty who are graduates	
of the same university	15%
from other universities within the State	33%
from universities from other States	52%
from universities from other Countries	-

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

Table SBFT25: List of faculty members awarded Ph.D. in the last 5 years

Name of Faculty Member	Year of Award of Ph.D. degree
Anshul Sharma	2015
Chandrika Attri Seth	2015

38. Present details of Departmental infrastructural facilities with regard to

a) Library:

The School utilizes the fully digitized Central library of the University where faculty and students get both formal and 'out-of-classroom' learning through the Learning Management System (LMS) and Knowledge Management System (KMS). Moreover, it also extends the reach of Shoolini University's online platform (eUniv). Here, magazines, journal and newspapers are provided to all over to encourage the habit of reading among students.

Moreover, the school has its own library, which is linked to the Central Library. Here, we have kept minimum physical books and journals and, the school library is more in the form of a 'virtual' library. Following books and journals are available for students in the library:

- Total Books available: 5990 + more than 1 lakh e-books
- Total Books in School library 386
(purchased under MoFPI grant)
- Reference Books available: 480
- Journals: 17+ 9000 e-journals(combined
science, technology and management)

b) Internet facilities for staff and students

Wi-fi, LAN, IT Lab

c) Total number of class rooms

5

- d) Class rooms with ICT facility 3
e) Students' laboratories 7

The following is the list of students laboratories for conducting various practical's:

Table SBFT26: List of student's laboratories

S. No.	Name of Lab
1.	Food Technology Lab-I
2.	Bioengineering Lab-I
3.	Bioengineering Lab-II
4.	Bioengineering Lab-III
5.	Bioengineering Lab-IV
6.	MoFPI sponsored Food Technology Lab –I*
7.	MoFPI sponsored Food Technology Lab-II*

*In MoFPI sponsored lab twenty seven major and minor equipment are being purchased. However, in the first phase following major instruments have been purchased and installed:

Table SBFT 27: List of equipments purchased under first installment of Grant

S.No.	Description	Make
1.	Spray Drier	Electrolab Ultima
2.	Brook Field Viscometer	Brook Field
3.	Bomb Calorimeter (Including Cylinder)	Toshival
4.	Lovibond Tintometer	UK Make
5.	Spectrophotometer-220 (With LCD Display/ Touch Model)	Thermo Scientific, USA
6.	Planetary Mixer	Sanco
7.	Sausage Filler	Sanco
8.	Noodle Machine	Sanco
9.	Cream Separator	Sanco
10.	High Speed Refrigerated Centrifuge with Rotors (4 x 100 ml & 24 x 1.5 ml) + Voltage Stabilizer	Remi
11.	Canning Retort	Sanco
12.	Canning Line (Only 401Dia accessories included)	Sanco

f) Research laboratories 4

S.No.	Name of the Research Lab	Description
1.	Biosensor Technology Lab	The focus of this lab is to develop genosensors and immune sensors for diagnosis of human and food borne pathogens.
2.	Food Quality Research Lab	The focus of the lab is to study the various quality parameters of the raw and processed food products from nutritional and microbiological view. The PG students work on the development of new food designs for consumers.
3.	Fermentation Technology Research Lab	The focus of this lab to develop fermented and nutraceutical, probiotic food products and also the secondary metabolites by the microorganisms
4.	Laboratory of gene regulation	Laboratory of gene regulation engaged in research on various aspects of Gene regulation. The laboratory supports research projects UG, PG and Ph.D. students. The Lab contains Refrigerated Incubator Shaker, Refrigerated Centrifuge, PCR Machine, Electroporator, etc.

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

a) from the host institution/university:

The following students have been registered for Ph.D. program in the School during 2014-15:

Table SBFT28: List of doctoral students registered for Ph.D program from Shoolini University

S. No.	Name of student	Reg. No.	Research Area	Name of Guide
1.	Anuj Saklani	FT-14-D-01	Dairy Technology	Dr. Ravinder Kaushik
2.	Avinash	FT-14-D-02	Food Chemistry	Dr. Pankaj Chauhan
3.	Sampy Duggal	FT-14-D-03	Food processing and characterization	Dr. Dinesh Kumar

b) from other institutions/universities: Nil

c) post-doctoral and Research Associate: Nil

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

The following is the list of PG student getting financial assistance as student merit scholarship from the university:

Table SBFT29: List of PG students getting financial assistance from university

S.No.	Name of student	Registration No.	Program
1	Rajni Mittal	13FTMTC05	M.Tech Food Technology

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

Yes, assessment exercise is undertaken before the start and development of new programs in the Faculty of Biotechnology. After assessing the current scenario of Biotech and Food Tech industries and research in India, proposal for starting any new program is formulated and presented before the School Academic Committee and once agreed upon the proposal is presented before the Board of Studies containing external expert members for discussion. Once it is approved by the Board of Studies, then the proposal is sent to the University Academic Council, which further deliberate on the comments of the Board of Studies and takes final decision on the new programs.

42. Does the department obtain feedback from

a) faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

Yes, feedback is obtained from the faculty on curriculum as well as teaching-learning evaluation on regular basis in the faculty meetings, Board of Studies, and other similar forums. The feedback from the faculty is used for the revision of syllabus, designing of practicals and improvement of teaching learning processes.

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

Yes, Feedback is obtained from the students on staff, curriculum and teaching-learning-evaluation by the Dean Academic Affairs. The feedback is shared with the faculty and staff to help them improve their teaching skills. The feedback of students is also taken into consideration for improving the curriculum and teaching-learning-evaluation.

c) alumni and employers on the programs offered and how does the department utilize the feedback?

Yes, feedback is obtained from alumni and employers on the programs offered regularly during their visits to the campus and at the time of 'Alumni Meet' and 'Convocations'. The feedback is utilized in designing and revision of the curriculum based on the experience of alumni in their place of work.

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

Our University is too young to have distinguished Alumni as it is only five years old. At present only four batches of post graduates and three batches of undergraduate programs have passed out. However, the alumni are on the path of success. Following is the list of some of successful alumni placed in reputed companies and pursuing research at National institutes:

Table SBFT 30: List of successful alumni of the School

S.No	Name of the Student	Degree completed	Placed in
1.	Shweta Shandilya	M.Tech. Food Technology	Nestle India
2.	Aroshi Tomar	M.Tech. Food Technology	Nestle India
3.	Damini Parmar	B.Tech. Food Technology	Dabur
4.	Shubham Pathak	B.Tech. Food Technology	Cremica
5.	Prakriti Punj	B.Tech. Food Technology	Nutrahelix Biotech, Mumbai
6.	Ajay Kumar	B.Tech. Biotechnology	Panacea Biotech
7.	Aroshi Sharma	B.Tech. Food Technology	Institute of Chemical Technology, Mumbai
8.	Sugandha Angiras	B.Tech. Food Technology	Nestle India
9.	Deepash	B.Tech. Biotechnology	Genaxy
10.	Alankrita Justa	B.Tech. Biotechnology	Agilent India

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

The following guest lectures were organized jointly by the School of Bioengineering and Food Technology and School of Biotechnology for student enrichment:

Table SBFT 31: List of special lectures organized as enrichment program for students

S. No.	Expert Name	Affiliation	Topic
1.	Prof. A.K. Bhatt	Department of Biotechnology, H. P. University Shimla.	Biotech park of Himachal Pradesh: Status and future prospects.
2.	Prof. S. P. Vij	Professor Emeritus & NASI Senior Scientist, Panjab University, Chandigarh.	Plant Diversity: Conservation and Sustainable Development for Community Livelihood.
3.	Prof. S. S. Kanwar	Department of Biotechnology, H. P University Shimla.	Stem cells in regenerative medicine
4.	Prof. I.S. Dua	Professor Emeritus, Punjab University Chandigarh	Understanding self romance with biology
5.	Prof. R.K. Kohli	Dean Research, Department of Botany, Punjab University Chandigarh	Alien plant invasion: Ecological impact in India
6.	Prof. S.C. Verma	Professor Department of Botany, Punjab University Chandigarh	Fathoming the Pteridophyte Genome: Challenges and opportunities.
7.	Prof. H.V. Batra	Director, Defense Food research Laboratory, Mysore	Recent food trends and researches at DFRL Mysore
8.	Prof. N. S. Thakur	University of Horticulture & Forestry, Solan	Food Laws and regulations governing food Industry
9.	Prof. Sonal Malhotra	Professor, Addis Ababa Institute of Technology, Ethiopia	Recent advances in diagnosis of cancer in humans
10.	Mrs. Shweta Singh	Director, Innobel, New Delhi	Intellectual property rights and their advantages for industry, research and academia
11.	Prof. Kulwant Rai	Professor, University of Horticulture and Forestry, Solan	Plant Diversity of Himalayan Region
12.	Prof. David	Bergeron Oliver Wyman, USA	Thoughts from a Hidden Physicist.
13.	Dr. Duni Chand	Department of Biotechnology, H. P. University Shimla.	Role of Plants in Human Life
14.	Dr. T. Bind	BD Biosciences, New Delhi.	Basics of Flow Cytometry

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

The faculty member makes use of blend of traditional and modern innovative methods for teaching of different programs offered in the School. Following methods are adopted for teaching and improving the skills of the students under different programs:

- **Lecture method:** Teaching through lectures by using chalk and talk and power point presentations
- **Innovative methods:** Assignments through LMS (Learning Management System) and online lectures on e-UNIV
- **Interactive Teaching:** Interactive teaching through class room quizzes, mock and surprise tests
- **Seminars and project presentations:** Mandatory class seminars and minor and major research work presentations to improve the scientific skills of the students
- **Lab and industrial visits:** Training in industries and R&D institutions is a mandatory part of course curriculum in undergraduate programs
- **Experimental learning:** Students are trained to improve their practical skills through lab experiments

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

All offered programs are designed with quantifiable vision and outcomes. The progress of each program objectives is periodically monitored in faculty meetings, student interactions and interaction with other stake holders. The learning outcome of each program is monitored continuously by adopting two strategies. First by university evaluation which comprises Quizzes, Surprise tests/Oral tests, Tutorials, Assignments, Seminars and Viva-voce exams. In second strategy regular inputs from BoS, faculty and stake holders are taken for measuring adaptability of offered program in the current scenario of research and industry applications.

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

The faculty members and student participates in all extension activities conducted by the university from time to time. Students and faculty members actively participate in Blood Donation camp, Adventure activities, social activities e.g. cleanliness drive and other awareness programs organized by the

university. Beside this some extension activities are also organized at the level of Faculty and following is the list of some extension activities:

- DBT sponsored training cum seminar on molecular biology techniques for college lecturers (November 11-19, 2012).
- Fascination of Plants Day” in collaboration with European Plant Science Organization (EPSO) for creating awareness amongst the science students about the environment and its value for the human society (May 18th, 2012 and May17th, 2013)
- Awareness program for farmers on protection of plant varieties and farmers rights, sponsored by PPV& FRA, Ministry of Agriculture (February 19th , 2013)
- Conducted One day hands on training for rural women on food product development (April 5th, 2015)
- The Faculty and Students took active part in Swach Bharat Abhiyan

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

Besides classroom teaching & Research activities following activities are undertaken by the students and faculty members in the School:

- Students are encouraged to develop and promote food based products through exhibition on special occasions in campus for entrepreneurship training.
- SPRINT program organized in School provides opportunities to students in developing leadership qualities, personality development and English speaking and improving writing skills.
- Students regularly participates in all inter-school and inter university cultural/sports/science/quiz competitions
- Student participation in all university events and various clubs of the university.
- Students are also encouraged to participate in National and International conferences to present research papers and scientific posters. Following are some of the participations by the faculty and students:

Poster Presentation/Abstracts

1. Babita, Kumar A, Kumar D, Sharma S. 2013. Production of vinegar from apple juice (golden variety) using *Acetobacter aceti*. 1st Annual National Conference, science: Emerging Scenario & Future Challenges, by Him Science congress Association at Shoolini University, on 8-10 March, 2013.
 2. Alisha, Kumar A, Sharma S, Kumar D. 2013. Isolation of probiotic lactobacillus and its use in preparation of curd. 1st Annual National Conference, science: Emerging Scenario & Future Challenges, organized by Him Science Congress Association at Shoolini University, on 8-10 March, 2013.
 3. Gupta M, Sharma S, Tokas J, Kothari N. 2014. Studies on development and evaluation of millet based probiotic beverage. In: International Symposium on Probiotics and Microbiome: Gut and Beyond, organized by Probiotic Association of India at India Habitat Centre, New Delhi, on 3-4 Nov, 2014.
 4. Poonam, Seth CA and Seth A. 2015. Optimization of culture condition for the production of acrylamide by alkali stable nitrile hydratase using response surface methodology. In: National Conference on advances in Agricultural Sciences, at DAV College Jalandhar on 28th Feb, 2015.
 5. Kumari A, Chauhan S, Seth CA, Seth A. 2013. Isolation and screening of amidase producing microorganism from soil of Himachal Pradesh. In: International Symposium on 'Frontier Discoveries and Innovations in Microbiology and its Interdisciplinary Relevance' (FDMIR-2013), organized by Department of Microbiology, at Department MDU, Rohtak on 17-20 Nov, 2013.
 6. Chauhan S, Kumari A, Seth CA Seth A. 2013. Isolation and characterization of xylanase producing bacteria from soil of Tatapani Hot Spring of Himachal Pradesh. In: International Symposium on 'Frontier Discoveries and Innovations in Microbiology and its Interdisciplinary Relevance' (FDMIR-2013), organized by Department of Microbiology, at Department MDU, Rohtak on 17-20 Nov, 2013.
- 49. State whether the program/ department is accredited/ graded by other agencies? If yes, give details.**

The University has been assessed by the UGC. However, the B.Tech Food Technology program of School of Bioengineering and Food Technology is supported for infrastructure creation by the Ministry of Food Processing Industries (MoFPI), New Delhi under the HRD scheme.

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

The School has generated following new initiatives/outputs in their respective fields of study:

- Provided consultancy to HPMC to improve the existing facilities and given technical input in improving existing food products and developed new food products.
- Developed Probiotic and nutraceutical rich milk based food products.
- Developed technology for zein and xanthophylls (a valuable maize protein and pigments) extraction from corn flour.
- Developed technology for making different fruit based alcoholic beverages and non alcoholic beverages
- Developing technology for the utilization of Wild Himalayan fig for the sustainable agriculture in the mid hill region of Himachal Pradesh.
- Developed Fortified milk based drinks.
- Development of genetic marker for early detection of rheumatic heart disease (*Streptococcus pyogenes*), Celiac disease & Food Borne pathogens
- Conducted hands on training on the utilization of locally available fruits and vegetables for product development for societal upliftment of rural women
- Plant growth rhizobacteria were isolated from wide range of crops from Himachal Pradesh, which have proven potential as biofertilizer.

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

Strengths:

Excellent teaching and placement of students:

The School provides excellent teaching and research facilities to its students. The focus of the teaching is to develop technically qualified, skilled, competent human resource through excellent teaching and hands on training to enhance their employability.

The students of School were selected in diverse fields through campus placements to serve in top leading companies viz. Biocon, Dabur, Nestle India, BioMerieux, Panacea Biotech, Agilent India, Nutrahelix, Cremica etc. Besides this the pass out of this School were selected in top National and International Institutes to pursue their higher studies

Industry and skill oriented Program curriculum:

The course curriculum is designed with the input from the industry and academia to produce skilled manpower for the Biotechnology and Food Technology based industries. The course curriculum gives student a leverage to choose a course of interest for their specialization during the degree to meet the specialized needs of the industries.

Recognition from National Funding agencies:

At present the School infrastructure is supported for Food Technology program by the Ministry of Food Processing Industries, India with a Grant of Rs 73.71 lakh. Under this support 27 major and minor equipments are being purchased to strengthen the existing facilities for UG and PG programs.

Besides the School is recognized by MoFPI to set up commercial food testing facility in North India with financial support of approx. 3 crores (Grant to be released).

Diversity of faculty expertise:

The School is having highly qualified and dedicated faculty members committed for imparting State of Art teaching and research training in the diverse field of Biotechnology and Food Technology. Faculty members are trained from repeated National institutes viz. NDRI, Karnal; SLIET, Longowal; UHF, Nauni; HPU, Shimla and HNB, Garhwal. Besides, active involvement of Post Doctoral faculty trained from USA and Germany.

Quality research by the Faculty:

The faculty members of the School have published high quality research publications in journals of national and International repute with citation in Scopus or Thompson Reuters. The faculty members of School are having four individual extramural funded projects from National funding agencies (DST and DBT, Govt. of India) amounting to Rs 76.15 lakhs and one international collaborative project amounting to Rs 64.80. Besides, this one more R&D project on Development of Biosensors for detection of human disease is recommended and in final stage of grant approval by the ICMR, New Delhi.

Weaknesses:**Lack of collaborative research:**

The School is having some collaborations with industry and academia at national level but lacks International research collaborations and projects with International funding agencies.

Strengthening of existing facilities:

The present facilities existing for teaching and research further needs to be upgraded to meet the global standards. More high ended equipments required to be added to the existing facilities to strengthen the existing facilities to achieve excellence in the teaching and research.

Bridging the gap between industry and academia:

At present the programs offered by the School gives leverage to students to choose special papers to train them as per the needs of industries. There is still need for more industry based specialized training modules to bridge the gap between industry expectations and technical skills of the students.

International patents:

The faculty members of the School have already filed some national patents on the area of their respective research and two or three more patents are at final stage of their filling at the National level. More efforts are required to file patents at international levels to match the research competency with global standards.

Opportunities:**Improvement of international tie ups for exchange programs:**

The School needs to emphasis on improvement of existing international tie ups and strengthen the student and faculty exchange programs. Besides this opportunities should also be looked out for developing international joint research projects with partner institute.

Enhance the employability of students:

More focus on training the students for research at par with International standards to make them employable for job and research in abroad. Besides this the students should be encouraged to prepare for global competence by pursuing excellence in teaching with specialized training and mentorship to help them in qualifying various national (NET/GATE etc) and international competitive examinations (GRE/TOEFEL etc).

Technology transfer and commercialization:

The School has developed some process technologies for novel consumer based natural food products. Efforts are required to transfer these technologies to small and large scale industries for their commercialization.

To strengthen faculty skills:

To provide more opportunities to Faculty members for attending training workshop/seminar/conference/orientation and refresher courses at National and International Levels.

Creation of Pilot Plant Scale facilities:

The state being fruit bowl of India and located in the Western Himalayan Region has lot of potential to use the natural and wild flora for the new food product designs. There are lot of opportunities with the School for utilization of Himalayan wealth for nutraceutical and functional food development. The setting up of pilot plant scale facilities help in training the students and rural people to start up their entrepreneur ventures for commercial activities besides adding value to their produce.

Challenges:

National and International collaborative research:

The School has been successful in getting R&D and infrastructural creation grants from various National funding agencies. Now, the major challenge of the School at present is to attract more National and International collaborative research projects for excellence in the research.

To strengthen extension activities:

At present the School has conducted training activities for the rural women of the nearby villages in food processing and development under the extension activities. Now, the focus of the School is to start extension activities through village adoption for the self sustainability of rural folk.

Transfer of developed process technology:

The School has been regularly displaying the novel and value added food and bio processed products in various activities and exhibitions held in the University. Efforts are required for the transfer of all potential developed process technologies from laboratory to the industry for its commercialization.

To attract best faculty and students:

Another challenge of the School is to attract more trained Post Doctoral faculty in the Food Technology and Bioengineering Sciences. The School provides excellent teaching and research facilities to the students and is having diversity of students which is evident from the fact that more than the eighteen states of India are represented by the admitted students. But still it is a challenge for the

School to attract good students and researchers for higher studies as compared with Government organizations.

To develop Research Centre in Food and Bioprocess Technology:

The School has already received one grant from MoFPI to purchase 27 major and minor equipments to support the food technology program. Besides this another project on setting up of Food Testing laboratory at University campus is in pipe line. Based on the strength of equipments availability at First phase the School intends to set up a Research Centre in Food & Bioprocess Technology in second stage with more support for high ended equipments from national & international agencies.

52. Future plans of the department

- Strengthening of skill and entrepreneurship based learning programs to facilitate employability of students in various Food and Biotechnology related industries.
- Focus to promote more exchange of students and faculty in academic and research programs with international partners.
- To organize International conferences as a platform for exchange of knowledge in current scientific scenario of Bioengineering and Food Technology.
- Exploration of possibility for commercialization and transfer of technology based on the current research and developed process technology.
- The long term plan of the School is to establish a Research Centre in Food and Bioprocess Technology. The focus of this center will be to harness wild and underutilized fruits, vegetables and medicinal plants of Western Himalaya region for the development of value added and nutraceutical food products.

3. Evaluative Report of School of Biological and Environmental Sciences

The School of Biological and Environmental Sciences is committed to provide scholarly standards in academic and research pursuits with a focus on Himalayan biodiversity. The mission of the School is to provide value based education and undertake research not only for inculcating science but also for the upliftment of the society by addressing regional and global challenges. The faculty members have diverse research interests and expertise in morphological, physiological and evolutionary aspects of plants and animal sciences. The School works within physiology, ecology, evolution, systematics, genetics, molecular biology and combinations of these fields in order to understand the impact of natural and anthropogenic changes of the environment.

In addition to classroom teaching, the School focuses on modern techniques like seminars, symposia, workshops, invited lectures, botanical and zoological excursions which help in nurturing science in young brains. The research activities stretch from the Himalayan ecosystem through forests, cultivated land and streams, all the way into the aquatic environment.

1. Name of the Department: School of Biological and Environmental Sciences

2. Year of establishment: 2009

3. Is the Department part of a School/Faculty of the university?

Yes, School of Biological and Environmental Sciences is the part of Faculty of Basic Sciences.

4. Names of programs offered (UG, PG, M.Phil., Ph.D, Integrated Masters; Integrated Ph.D, D.Sc., D.Litt., etc.)

School of Biological and Environmental Sciences offers following programs:

Table BES01: List of programs offered

S. No.	Level	Program
1	UG	B.Sc (Hons) in Botany and Zoology
2	Dual Degree	B.Sc (Hons) –M.Sc. Dual Degree
3	PG	M.Sc Botany; M.Sc Zoology; M.Sc Environment Science
4	M.Phil	Botany, Zoology, Environment Science
5	Ph.D	Botany, Zoology, Environment Science

5. Interdisciplinary programs and departments involved

The importance of interdisciplinary study in the Biological and Environmental sciences has led to far-reaching interactions among Schools from diverse faculties. Following is the list of other Schools involved in the teaching of selective courses taught under different programs of Biological and Environmental Sciences:

Table BES02: List of Biological and Environmental Sciences programs supported by other Schools

S.No.	Program	School
1	B.Sc (Hons) (Botany, Zoology)	School of Physics and Materials Science School of Chemistry School of Biotechnology
2	M.Sc. (Botany, Zoology)	School of Electrical and Computer Science Engineering School of Business Management
4	M.Phil (Botany, Zoology, Environment Science)	School of Biotechnology School of Chemistry School of Pharmaceutical Sciences
5	Ph.D (Botany, Zoology, Environment Science)	

6. Courses in collaboration with other universities, industries, foreign institutions, etc.

B.Sc (Hons) course with Gachon University and Suwon University, South Korea for one semester.

7. Details of programs discontinued, if any, with reasons

M.Sc Environment Science, was withdrawn from 2013-14 because the number of students joining the program were less than five. This was done in accordance with the directions of H.P. Private Educational Institutions Regulatory Commission.

8. Examination System

The School of Biological and Environmental Sciences has been following the semester and OCPA/OGPA grading system for undergraduate, postgraduate, M.Phil and Ph.D programs. Choice Based Credit System is being followed from academic session 2015-16 as per the guidelines of UGC.

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

Yes, the School is actively exchanging faculty in programs run by other Schools. Since the university is offering Choice Based Credit System, the School is participating in electives offered by other Schools. Following is the list of courses or electives taught by the School of Biological and Environmental Sciences for programs offered by other Schools:

Table BES03: Courses or electives taught by School of Biological and Environmental Sciences for Programs run by other Schools

S. No.	Courses/Electives	Programs	Schools
1	Introductory Biology-I and II	B.Sc (Hons) Physics	School of Physics and Materials Science
2	Introductory Biology-I and II	B.Sc (Hons) Chemistry	School of Chemistry
3	Fundamentals of Environmental Science and Bioengineering	B.Tech Nanotechnology; Civil Engineering; Mechanical Engineering; Electrical Engineering; Electronics and Communication Engineering; Computer Science and Engineering	School of Electrical and Computer Science Engineering School of Mechanical and Civil Engineering
4	Chemistry of Life	M.Sc Chemistry	School of Chemistry
5	Remedial Biology	B. Pharmacy	School of Pharmaceutical Sciences

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

Table BES04: Post sanctioned/filled/actual as per UGC norms.

Teaching Post	Sanctioned	Filled	Actual (including CAS & MPS)
Professor	3	3	3
Associate Professors	4	1	1
Asst. Professors	6	4	5
Others (Teaching Assistant)	2	2	2

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance.

a) Faculty members from School of Biological and Environmental Sciences

Faculty members of School of Biological and Environmental Sciences are committed to provide the knowledge, skills, and experiences to the students which is helpful to the students in achieving their goals related to life science professions. Following is the list of faculty members for School of Biological and Environmental Sciences:

Table BES05: List of current faculty for School of Biological and Environmental Sciences

S. No.	Name	Qualification	Designation	Specialization	Years of Experience	Ph.D/ M.Phil students guided for the last 4 years	Ph.D./ M.Phil. students currently guiding
1	Prof. P.K. Khosla*	Ph.D.; Post-Doc	Professor cum Vice Chancellor	Genetics	41	-	Ph.D: 3
2	Prof. Sunil Puri	Ph.D.; Post Doc	Professor	Plant Physiology	37	Ph.D: 2 M.Phil: 7	Ph.D: 7
3	Prof. J.M. Julka*	Ph.D.; Post Doc	Professor Of Eminence	Animal Taxonomy and Ecology	35	Ph.D: 1 M.Phil: 1	Ph.D: 4 M.Phil: 1
4	Prof. G.K. Sharma	Ph.D.	Professor	Forestry	30	-	-
5	Dr.Jagdeep Verma	M.Phil.; Ph.D.	Associate Professor	Plant Systematics	7	Ph.D: 1 M.Phil: 2	Ph.D: 1
6	Ms.Rachna Verma	M.Phil.	Assistant Professor	Mycology	8	-	
7	Dr. Sujata	M.Phil., Ph.D.	Assistant Professor	Plant Physiology	6.8	-	Ph.D: 5
8	Ms.Mamta Sharma	M.Sc.; M.Phil.	Assistant Professor	Plant physiology	6.8	-	
9	Ms.Amita Kumari*	Ph.D viva awaited	Assistant Professor	Plant Molecular Biology & Genetics	5.5	-	
10	Ms. Sharan Kahlon	M.Sc.	Teaching Assistant	Zoology	1	-	
11	Ms. Shailja Kumari	M.Sc.	Teaching Assistant	Zoology	1	-	

*Ms Amita Kumari is deputed to School of Mechanical and Civil Engineering for teaching purpose and is not counted here for calculating teacher student ratio. Prof. PK Khosla and Prof. JM Julka are also not counted.

b) Faculty members from other Schools teaching at School of Biological and Environmental Sciences

School of Biological and Environmental Sciences run interdisciplinary courses such as Biostatistics, Computer Applications, Introductory Chemistry, Geochemistry, Chemical Transformations, Solution Chemistry, World of Physics, Classical Mechanics, Persona Enhancement, Sociology, Research Methodology and Instrumentation, Gene regulation, Molecular biology of plant viruses, Enzymology and Enzyme Technology which require additional faculty from other Schools. Following is the list of faculty members from other Schools taking these courses in School of Biological and Environmental Sciences:

Table BES06: List of faculty members from other Schools

Name	Qualification	Designation	Specialization	Years of Experience	School
Dr. Amit Kumar	Ph.D	Assistant Professor	Physical Chemistry	4	School of Chemistry
Dr. Gaurav Sharma	Ph.D	Assistant Professor	Organic Chemistry	2	
Dr. Pardeep Singh	Ph.D	Assistant Professor	Physical Chemistry	4.5	
Dr. Deepak Pathania	Ph.D	Associate Professor	Organic Chemistry	15	
Prof. O. P. Monga	Ph.D	Professor	HR, Sociology of Family, Social Gerontology	37	School of Business Management and Liberal Arts
Mr Sharad	MS. (IT)	Assistant Professor	Communication	5	
Dr. Rakesh Shukla	Ph.D	Assistant Professor	Statistics	5	
Dr. Atul Thakur	Ph.D; Post-Doc	Associate Professor	Material Science; Nanotechnology	12	School of Physics and Materials Science
Dr. Radheshyam Rai	Ph.D; Post-Doc	Assistant Professor	Solids State Physics	11	
Ms. Bharti	M.Sc IT	System Analyst	IT	5	School of Electrical and Computer Science Engineering

Name	Qualification	Designation	Specialization	Years of Experience	School
Dr Adesh K. Saini	Ph.D; Post-Doc	Associate Professor	Gene Regulation	9	School of Bioengineering and Food Technology
Dr. Saurabh Kulshrestha	Ph.D; Post-Doc	Associate Professor	Molecular Plant Microbe Interaction	9	
Dr. Anshul Sharma	Ph.D	Assistant Professor	Molecular Biology of Plant Viruses	2	

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

In School of Biological and Environmental Sciences, Professor of Eminence, adjunct faculty and professor emeritus strive to increase the academic and research competitiveness of faculty members and students. Following is the list:

Table BES07: List of Professor of Eminence, adjunct faculty and professor emeritus for School of Biological and Environmental Sciences.

S. No.	Category	Name	Organization
1	Professor of Eminence	Late Prof. S.P. Vij*	Former Chairman, Deptt. of Botany, Panjab University, Chandigarh
		Prof. JM Julka	Director Planning and Placement, Shoolini University, Solan
		Prof. Arundeeep Ahluwalia	Professor, Centre of Advanced Study in Geology, Panjab University, Chandigarh
2	Adjunct Professor	Prof. I.S. Dua	Former Professor (Plant Molecular Physiology); Former, Chairman, Deptt. of Botany, Panjab University, Chandigarh

*Served since inception of the University till 22nd October 2013

13. Percentage of classes taken by temporary faculty – Program-wise information: Nil

14. Program-wise Student Teacher Ratio:

○ UG	:	10:1
○ PG	:	7.75:1

15. Number of academic support staff (technical) and administrative staff:**Table BES08: List of academic support and administrative staff**

Staff	Sanctioned	Filled	Actual (including CAS & MPS)
Academic support staff	4	4	4
Administrative staff	2	1	1

16. Research thrust areas as recognized by major funding agencies:

The strength of the School lies in its unique focus on the conservation of Himalayan Biodiversity, which positions the School well to exploit growing funding opportunities and to develop strong student interest in sustainable utilization of environmental resources. Research interests of the School are unique that range from conservation and evolutionary ecology to environmental processes highlighting:

- Impact of climate change on productivity and nutrient dynamics of trees, crops & soil in different land use systems
- Abiotic stress studies in relation to growth and development of flora in North-Western Himalayas
- Morphological, biochemical and physiological variations in plants of Western-Himalaya
- Research and development in agroforestry and forestry (natural and plantation) to enhance productivity, carbon sequestration and livelihood options in the Himalayas
- Vegetative propagation of forest and agroforestry tree species
- Altitudinal variations in biodiversity (flora & fauna)
- Sex determination in dioecious plants at juvenile stage using biotechnological tools
- Impact of water pollutants on the aquatic fauna especially fishes of Himachal Pradesh
- Plant biodiversity and chromosomal polymorphism of the Himalayan trees

17. Number of faculty with ongoing projects from

a) National: 04

The School has been successful in getting grants from different government agencies. One of the prime projects is in relation to motivating School youth to take-up basic sciences as a career. Following are the projects granted by different funding agencies to faculty and students:

Table BES09: List of faculty project

S. No.	Title of the Project	Investigator	Funding agency	Amount
1	INSPIRE Science Internship Program	Prof. Sunil Puri	DST	94 lakhs per annum

Table BES10: List of student projects

S. No.	Title of the Project	Investigator	Year	Funding agency	Amount
1	Abiotic stress mediated consequences on antioxidant defense system and secondary metabolites in <i>Andrographis paniculata</i> Wall. Ex Nees	Ms. Sujata under the supervision of Prof. Sunil Puri	2010-2014	INSPIRE Fellowship, DST	12 lakhs
2	Quality assessment of surface and ground water along Buddha Nallah in Punjab, India	Ms. Navdeep Kaur under the supervision of Prof. Sunil Puri	2012-2017	Maulana Azad National Fellowship For Minority Students, UGC	10.80 lakhs
3	Abiotic stress alleviation using Plant Growth Promoting Rhizobacteria (PGPR) in medicinal plants of North-Western Himalaya	Ms. Menaka under the supervision of Dr. Sujata Bhattacharya	2015-2020	INSPIRE Fellowship, DST	17 lakhs

b) international funding agencies Nil

c) Total grants received: Rs. 1, 32, 88, 000/- (One Crore Thirty Two Lakhs Eighty Eight Thousand only) including INSPIRE grants

18. Inter-institutional collaborative projects and associated grants received: Nil

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

DST-FIST applied in collaboration with Faculty of Biotechnology and Applied Sciences for a grant of Rs 3.0 crores.

20. Research facility / centre with

- State recognition - Nil
- National recognition – Nil
- International recognition – Nil

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

22. Publications:

- Number of papers published in peer reviewed journals : 40*
- Monographs : -
- Chapters in Books : -
- Books Edited : -
- Books with ISBN with details of publishers : 1
 - S. P. Vij, Jagdeep Verma and C. Sathish Kumar (2013). Orchids of Himachal Pradesh. Bishen Singh Mahendra Pal Singh, Dehradun, ISBN: 978-81-211-0862-1.
- Number listed in International Database : -
- Citation Index : 2
- SNIP (*Source Normalized Impact per Paper*) : -
- SJR (Scientific Journal Ranking) : -
- Impact Factor (average) : 1.2
- h-index : 1.8

List of publications:

1. Bhattacharya S, Puri S, Jamwal A, Sharma S. Studies on seed germination and seedling growth in Kalmegh (*Andrographis paniculata* Wall. Ex Nees) under abiotic stress conditions. *International Journal of Science, Environment and Technology*. 2012.1(3), 197-204.

2. Chauhan S, Kumar A, Mangla C, Aggarwal A. Inoculum production of endomycorrhizal fungi: effect of hosts and substrate in rapid culturing of *Glomus mosseae*. **Continental Journal of Biological Sciences**. 2011. **4**(2):6-12.
3. Gawali A, Puri S, Swamy SL. Growth, biomass, carbon sequestration and nutrient storage in *Ceiba pentandra* (L) Gaertn. Stands in sub humid tropics of Eastern India. **Ecology, Environment and Conservation**. 2014. 71-81.
4. Jamwal A, Puri S, Sharma S, Bhattacharya S. Impact of water-deficit stress on the seed germination and growth of *Lycopersicon esculentum* 'Solan Sindhur'. **NeBIO**. 2012. **3**(2), 118-123.
5. Kant R, Verma J, Thakur K. Distribution pattern, survival threats and conservation of 'Astavarga' orchids in Himachal Pradesh, Northwest Himalaya. **Plant Archives**. 2012. **12**(1): 165-168.
6. Kant R, Verma J. Obligate apomixis in *Zeuxine strateumatica* (Lindl.) Schltr. (Orchidaceae). **Vegetos**. 2012. **25** (1): 274-277.
7. Kaur R, Sharma M, Puri S. Comparison of nutrient distribution in monoculture and polyculture land use system of sub-temperate midhills of Himachal Pradesh. **Global Journal of Biology, Agriculture and Health Sciences**. 2013, **2** (2):42-45.
8. Kaushish S, Kumar A, Aggarwal A, Parkash V. Influence of inoculation with the Endomycorrhizal fungi and *Trichoderma viride* on morphological and physiological growth parameters of *Rauwolfia serpentina* Benth. ex. Kurtz. **Indian Journal of Microbiology**. 2012. **52**(2): 295–299.
9. Kaushish S, Kumar A, Aggarwal A. Influence of hosts and substrates on mass multiplication of *Glomus mosseae*. **African Journal of Agricultural Research**. 2011. **6**(13): 2971-2977.
10. Kaushish S, Kumar A, Mangla C, Aggarwal A. Mass multiplication of AM inoculum: effect of hosts and substrates in rapid culturing of *Acaulospora laevis*. **Indian Phytopathology**. 2011. **64**(2): 150-153.
11. Kaushish S, Tanwar A, Kumar A, Karishma, Aggarwal A. Seasonality of arbuscular mycorrhizal symbiosis in the rhizosphere of *Rauwolfia serpentina* and *Tylophora asthamatica*. **Mycorrhiza News**. 2011. **23**(1): 6-11.
12. Khosla P, Kumari A. Methods of sex determination in dioecious angiospermous plants. **Lakshya: Journal of Science and Management**. 2015. **1**(1): 1-9.
13. Kumar D, Savitri, Thakur N, Verma R and Bhalla TC. Microbial proteases and application as potential laundry detergent additive. **Research Journal of Microbiology**. 2008, **3**: 661-672.
14. Kumar D, Verma R and Bhalla TC. Citric acid production from apple pomace left after juice extraction by *Aspergillus niger* van.

- Tieghem MTCC-281. *Journal of Food Science and Technology*. 2010, **47**(4):458-460.
15. Kumar D, Verma R and Bhalla TC. Commercializing the traditional fermented alcoholic beverages of India. *Invention Intelligence*. 2007, **42**:19-23.
 16. Kumar D, Verma R, Sharma P, Rana A, Sharma R, Prakash C and Bhalla T C. Production and partial purification of xylanase from a new thermophilic isolate *Bacillus pumilus*. *Biological Forum- An International Journal*. 2010, **2**(2):83-87.
 17. Kumari A, Bhardwaj P, Khosla P. Molecular identification of gender in *Populus ciliata* Wall. ex Royle using isozyme and RAPD Markers. *Int. J. Biological and Pharmaceutical Research*. 2014, **5**(5): 415-421. (IF- 1.34)
 18. Kumari R, Puri S, Sharma M. Impact of seasonal variation on arbuscular mycorrhizal fungi in lower Himalaya, *International Journal of Pharma and Bio Science*. 2015, **6**: 140-160.
 19. Kundu S. Effects of industrial and agricultural activities on properties of groundwater. *Bulletin of Environment, Pharmacology & Life Sciences*. 2012, **1**(3), 03-06.
 20. Kundu S. Application of Statistical Analysis in Assessment of Seasonal and Temporal Variations in Groundwater Quality. *Bulletin of Environment, Pharmacology & Life Sciences*. 2012. **1**(3), 07-11.
 21. Kusum, Thakur K, Verma J. Study on distribution, habitat characteristics and seed morphometry of a medicinal orchid, *Eulophia herbacea* Lindl. in Himachal Pradesh. *Vegetos*. 2013. **26** (2): 121-126.
 22. Rana M, Kumari A, Chauhan GS, Chauhan K. Modified chitosan microspheres in non- aggregated amylase immobilization. *International Journal of Biological Macromolecules*. 2014, **66**: 46-51.
 23. Sembi JK, Verma J, Pathak P, Vij SP. Regeneration competence of *Aerides multiflora* root segments: a study in vitro. *Journal of Orchid Society of India*. 2011. **25** (1-2):5-8.
 24. Sharma M, Kour R, Puri S. Quantification of Withanolide A from *Withania somnifera* Dunal in tropics of Himalaya using HPLC with DAD detector. *International Journal of Biological & Pharmaceutical Research*. 2013, **4**(10): 702-705.
 25. Sharma M, Sood SK. Studies on the Ethnobotany of wild plants of Solan H.P. *International Journal of Environmental Biology*. 2013, **3**(3): 87-95.
 26. Sharma S, Jamwal A, Puri S, Bhattacharya S. Impact of water-deficit and salinity stress on seed germination and seedling growth of *Capsicum annum* "Solan Bharpur". *International Research Journal of Biological Sciences*. 2013. **2**(8), 9-15.

27. Thakur K, Santvan VK, Verma J. Floristic composition and life form spectrum of Bandli Wild Life Sanctuary, District Mandi, Himachal Pradesh. *Plant Archives*. 2012. **12** (1): 57-62.
28. Verma J, Kusum, Thakur K, Vij SP. Lesser known orchids of Himachal Pradesh: Genus *Zeuxine* Linbley. *Pleione*. 2014. **8**(1):1-8.
29. Verma J, Sembi JK, Thakur K, Pathak P and Vij SP. Epiphytic orchids of Himachal Pradesh. *Journal of Orchid Society of India*. 2009. **23** (1, 2): 49-61.
30. Verma J, Sharma K, Thakur K, Sembi JK, Vij SP. Study on seed morphometry of some threatened Western Himalayan orchids. *Turkish Journal of Botany*. 2014. **38**: 234-251.
31. Verma J, Thakur K, Kusum. Ethnobotanically important plants of Mandi and Solan districts of Himachal Pradesh, Northwest Himalaya. *Plant Archives*. 2012. **12** (1): 185-190.
32. Verma J, Thakur K, Santvan VK, Vij SP. Orchids of Bandli Wild Life Sanctuary, Himachal Pradesh, Northwest Himalaya. *Journal of Orchid Society of India*. 2011. **25** (1, 2): 29-32.
33. Verma J, Thakur K, Vij SP. On the occurrence of an interesting leafless orchid *Neottia listeroides* Lindl. in Himachal Pradesh, Northwestern Himalaya, India. *Journal of Threatened Taxa*. 2013. **5**(11): 4601–4603.
34. Verma J, Kusum, Sembi JK. On distribution and habitat ecology of a rare lady slipper orchid (*Cypripedium cordigerum* D. Don) in Himachal Pradesh. *Vegetos*. 2014, **27** (2).
35. Verma J, Kusum, Thakur K, Sembi JK, Vij SP. Studies on seed morphometry of seven Himalayan orchids exhibiting varied life modes. *Acta Botanica Gallica*. 2012. **159**(4): 443-449.
36. Verma J, Thakur K, Sembi JK, Attri LK, Kant R, Vij SP. Pollination in *Cymbidium pendulum* (Roxb.) Sw. (Orchidaceae). *Vegetos*. 2012. **25** (2): 298-302.
37. Verma R, Parkash V, Kumar D. Ethnomedicinal uses of some plants of Kanag Hill in Shimla, Himachal Pradesh, India. *International Journal of Research in Ayurveda and Pharmacy*. 2012, **3**(2): 319-322.
38. Verma J, Jaglan P, Thakur K, Sharma K, Attri LK, Vij SP. *Habenaria aitchisonii* Reichb. f. and *H. pubescens* Lindl. (Orchidaceae): New additions to flora of Himachal Pradesh. *Journal of Orchid Society of India*. 2010. **24** (1, 2): 53-56.
39. Verma J, Thakur K, Santvan VK, Vij SP. Notes on three ethnobotanically important orchids from Kullu and Mandi districts of Himachal Pradesh, NW Himalaya. *MIOS Journal*. 2011. **12** (7): 12-16.

40. Vij SP, Verma J, Thakur K. *Coeloglossum viride* (L.) Hartman and *Vanda cristata* Lindl. (Orchidaceae): Two new records for Himachal Pradesh. *Phytomorphology*. 2011. **61**(1, 2): 25-27.

23. Details of patents and income generated: Nil

24. Areas of consultancy and income generated: Nil

25. Faculty selected nationally / internationally to visit other laboratories / institutions / industries in India and abroad

Faculty members of School of Biological and Environmental Sciences have been invited to visit other labs/institutes. Following is the list of faculty and their visits:

Table BES11: List of Faculty selected nationally / internationally

S. No.	Faculty Name	National (Laboratory/Institution/ Industry)	International (Laboratory/Institution/ Industry)
1	Prof PK Khosla	<ul style="list-style-type: none"> • Directorate of Mushroom Research, Solan • Rubber Institute, Agartala • Shri Mata Vaishno Devi University, Katra, Jammu and Kashmir 	<ul style="list-style-type: none"> • Lanzhou University, Gansu Province, China • Chung Yuan Christian University, Taiwan • National Taiwan University, Taiwan • International Centre for Integrated Mountain Development, Kathmandu, Nepal • Seoul National University, South Korea • Suwon University, South Korea • Gachon University, South Korea • Gwangju Institute of Science and Technology, South Korea
2	Dr. Sujata Bhattacharya	<ul style="list-style-type: none"> • IARI, New Delhi • CSIR-National Botanical Research Institute, Lucknow • Directorate of Mushroom Research, Solan 	<ul style="list-style-type: none"> • Bukovinian State Medical University, Chernivtsi, Ukraine • International Centre for Integrated Mountain Development, Kathmandu, Nepal
3	Dr. Jagdeep Verma	<ul style="list-style-type: none"> • North Eastern Hill University, Shillong • Forest Research Institute (ICFRE), Dehradun 	
4	Ms. Mamta Sharma	<ul style="list-style-type: none"> • Forest Research Institute, ICFRE, Dehradun 	

26. Faculty serving in

a) National committees

Table BES12: List of faculty members serving as experts in national committees

S. No.	Faculty Name	Organization
1	Dr. P.K. Khosla	<ul style="list-style-type: none">• ICAR Panels member/chairperson on Agriculture and Home Science Education and Agro-forestry• Research Advisory Committee member, Govind Ballabh Pant Institute of Himalayan Environment and Development, Almora, Utrakhand• Member Rubber Institute, Agartala• National Centre on Agroforestry, Jhansi• National Mushroom Research Centre, Solan• Academic Councils member of a half dozen Universities
2	Dr. Sunil Puri	<ul style="list-style-type: none">• Coordinator Tropical Agroforestry of IUFRO Division 1• Coordinator Silviculture and Management in Arid and Semiarid Regions of IUFRO Division 1 (Silviculture)• Member Quinquennial Review Team (QRT) AICRP on Agroforestry• Academic Council member of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola• Indian Society of Agroforestry, IGFR, Jhansi• Forestry/Agroforestry Subject Matter Committee member• Steering Committee member of North East Hill University (NEHU), Shillong• Advisory Committee member of Indraprastha Vishwavidyalaya, Delhi• Chhattisgarh State of Medicinal and Aromatic Plants Board, Raipur• Governing Body Member of Indian Society of Tree Scientists, Solan

b) International committees

Table BES13: List of faculty members serving as experts in international committees

S. No.	Faculty Name	Committee
1	Dr. PK Khosla	<ul style="list-style-type: none">• International Society of Tropical Foresters, USA• Academic Councils of a half dozen Universities
2	Dr. Sunil Puri	<ul style="list-style-type: none">• Research Board of Advisors of the American Biographical Institute, USA

c) Editorial Boards

Table BES14: List of faculty members serving as experts in editorial boards

S. No.	Faculty Name	Journal
1	Dr. Sunil Puri	<ul style="list-style-type: none"> • Agroforestry Systems published by Kluwer Academic Publishers, The Netherlands • Range Management & Agroforestry Journal published by Range Management Society of India, IGRI, Jhansi • Agricultural Issues
2	Dr. Jagdeep Verma	<ul style="list-style-type: none"> • The Orchid Society of India (Journal of Orchid Society India, Orchid News)

d) any other (please specify)

Table BES15: List of faculty members with membership in different societies etc.

S. No.	Faculty Name	Membership
1	Dr. Jagdeep Verma	<ul style="list-style-type: none"> • Life Member, The Orchid Society of India (TOSI), Chandigarh • Life Member, Him Science Congress Association (HSCA), Solan
2	Dr. Sujata Bhattacharya	<ul style="list-style-type: none"> • Life member, International Society of Environmental Botanists, National Botanical Research Institute, Lucknow (India) • Life member, Indian society for plant physiology, Division of Plant Physiology, Indian Agricultural Research Institute, New Delhi (India) • Life member, Him Science Congress Association, Himachal Pradesh (India) • Member of Wildlife Crime Control Bureau (WCCB) Volunteer (HP00131), Ministry of Environment and Forests, Government of India

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

Faculty members of School of Biological and Environmental Sciences have attended in-service training, orientation, refresher courses and workshops organized in the University as well as in other Universities and institutions. Following is the list of different programs attended by the faculty:

Table BES16: List of faculty members attended Faculty Recharging Programs

S. No.	Faculty recharging strategies (UGC, ASC, Refresher/orientation programs, workshops, training programs)	Name of faculty Attended
Faculty recharging strategies organized in other Universities		
1	Two Weeks training programme on Capacity Building in Plant Taxonomy, Forest Research Institute, Dehradun, Utrakhand, 27 th September-8 th October, 2010	Dr. Jagdeep Verma
2	Summer Research Project on Single Primer Amplification Reaction (SPAR) to Access Inter-Specific Variability and Phylogenetic Relationships of Six Paphiopedilum Pfitzer (Orchidaceae) species, North-Eastern Hill University, Shillong sponsored by IASc (Bangalore), INSA (New Delhi) and NASI (Allahabad), May-July, 2012	
3	9 th Advanced Level Training in Soil Testing, Plant Analysis and Water Quality Assessment, Division of Soil Science and Agricultural Chemistry, IARI, PUSA Campus, New Delhi, 04-24 September 2012	Dr. Sujata Bhattacharya
4	Training course on Classical and Modern Methods in Plant Systematics, CSIR-National Botanical Research Institute, Lucknow, 04-10 March, 2013	
5	Research Training at Department of Medical Biology, Genetics and Pharmaceutical Botany of Bukovinian State Medical University, Chernivitsi, Ukraine, 11 th -22 nd April, 2013	
6	Training on Tissue Culture Techniques for Medicinal Plants, FRI, Dehradun, 16-20 December, 2013	Ms. Mamta Sharma
7	International Workshop and satellite Symposium on Entrepreneurship Development, Maharishi Dayanand University, Rohtak, Haryana, 17 th -20 th November, 2013	Ms. Rachna Verma

Faculty recharging strategies organized in Shoolini Universities		
1	Faculty Development Program, June, 2015	Ms. Mamta Sharma
2	Thesis and Paper Writing Seminar by Dr. Klaus von Gadow, Germany 2015	Dr. Sujata; Ms. Rachna Verma; Ms. Mamta Sharma; Ms. Amita Sharma
3	Personality Development by Prof. B. L. Dubey, University of Alaska, and Director SIS, Anchorage, USA, 2015	Dr. Sujata; Ms. Rachna Verma; Ms. Mamta Sharma; Ms. Amita Sharma
4	eUniv-LMS	Dr. Sujata; Ms. Mamta
5	Spiritual Leadership-I & II by Mr Rajendra Abhange, Senior Director Technology, Gabriel India, 2014	Ms. Mamta Sharma; Ms. Amita Sharma
6	Curriculum Development, Ms. Pooja Gupta, Consultant Higher Education, 2014	Dr. Sujata; Ms. Rachna Verma
7	Sampling Error and Analysis Techniques by Prof. Kulvinder Singh, Punjabi University, Patiala and Prof. S.S. Narta, H.P. University, Shimla, 2014	Ms. Amita Sharma; Ms. Rachna Verma
8	Research Writing Seminar by Ms. Andrea Wright, Brown University, USA, 2013	Dr. Sujata; Ms. Rachna Verma; Ms. Mamta Sharma; Ms. Amita Sharma
9	Teaching Pedagogy by Mr Arjun Singh, Ex MD Hewitt, 2011	Ms. Rachna Verma; Ms. Mamta Sharma; Ms. Amita Sharma
10	Workshop on Excel by Mr Parijat Banerjee, Engagement Manager, Oliver Wyman, Mumbai	Ms. Mamta Sharma; Ms. Amita Sharma
11	Training in Molecular Biology Techniques, 10-19 November, 2011, DBT, Shoolini University, Solan	Ms. Rachna Verma

28. Student project

Research projects in the School of Biological and Environmental Sciences provide undergraduate and postgraduate students a solid foundation in biology and allow students to pursue research in their special interests. All students conduct independent research under the supervision of a faculty mentor. The broad thrust areas include plant stress physiology, plant biochemistry, genetics, aquatic biology, mycology etc.

- percentage of students who have done in-house projects including inter- departmental projects: **90%**
- percentage of students doing projects in collaboration with other universities/ industry / institute: **10%**

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

Awards by Faculty:

Table BES17: List of awards/recognitions received by faculty

S. No.	Faculty Name	Award/ Recognition	Conference/ Organization	Year
1	Prof. P.K. Khosla	Best Entrepreneur Education Award	Associated Chambers of Commerce and Industry of India (ASSOCHAM)	2012
		Shiksha Ratan Award	All India Technical and Management Association (AITMA) at Confederation of Indian Industries (CII), Chandigarh	2012
3	Dr. Sujata	Travel Award	Bukovinian State Medical University, Chernivtsi, Ukraine	2013
		Travel Award	International Centre for Integrated Mountain Development, Kathmandu, Nepal	2014
		Best Poster presentation	International Conference on Adapting People Adapting to Change, Kathmandu, Nepal	2014
4	Dr. Jagdeep Verma	Young Achiever Award	Society of Advancement of Human and Nature, Dr. YS Parmar University of Horticulture and Forestry, Solan	2013
		Best Poster Award	National Seminar on Orchid Conservation, Improvement and Commercialization	2012

Doctoral / post doctoral fellows**Table BES18: List of awards/recognitions received by students**

S. No.	Student Name	Award/Recognition	Year
1	Ms. Sujata	INSPIRE Fellowship (DST)	2010
2	Ms. Navdeep Kaur	Maulana Azad National Fellowship for Minority Students Scheme (UGC)	2013
3	Ms. Menaka Thakur	INSPIRE Fellowship (DST)	2015

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

- Conducted a total of 21 INSPIRE Internship Programs sponsored by Department of Science and Technology (DST), Govt. of India

31. Code of ethics for research followed by the departments:

The School of Biological and Environmental Sciences follows ICMR code of ethics for Life Sciences

32. Student profile Program-wise:

Tabulated below:

Table BES19: Program-wise pass percentage of B.Sc, M.Sc, M.Phil and Ph.D students

Name of the Program	Year	Applications received	Selected		Pass percentage	
			Male	Female	Male	Female
B.Sc (Hons)	2012-13	9	1	5	100	100
	2013-14	18	6	12		
	2014-15	21	6	12		
M.Sc Botany	2011-12	11	3	8	100	100
	2012-13	12	-	12		
	2013-14	10	4	6		
	2014-15	26	4	15		
M.Sc Environment Science	2010-11	2	-	2	100	100
	2011-12	1	-	1		
M.Phil Botany	2009-10	2	-	2	100	100
	2010-11	3	-	3		
	2011-12	2	1	1		
	2012-13	3	-	3		
M.Phil Zoology	2011-12	1	-	1	-	-
	2012-13	1	-	1	-	-

Name of the Program	Year	Applications received	Selected		Pass percentage	
			Male	Female	Male	Female
M.Phil Environment Science	2011-12	2	-	2	-	100
Ph.D Zoology	2009	1	-	1	-	100
	2010	1	-	1	-	-
	2011	1	-	1	-	-
	2012	2	1	1	-	-
Ph.D Botany	2009	5	-	5	-	40
	2010	-	-	-	-	-
	2011	2	-	2	-	50
	2012	6	-	6	-	-
	2013	2	-	2	-	-
	2014	2	-	2	-	-
Ph.D Environment Science	2011	1	1	-	-	-
	2012	2	-	2	-	-
	2013	2	-	2	-	-

33. Diversity of students

Table BES20: Program-wise data for diversity of students

Program	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from Other countries
B.Sc	-	92%	8%	-
M.Sc	-	93%	7%	-
M.Phil	-	72%	28%	-
Ph.D	8%	73%	19%	-

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

- | | |
|------------------|----------------------------------|
| 1. Menaka Sharma | HP-Teacher Eligibility Test |
| 2. Luxmi Devi | HP-Teacher Eligibility Test |
| 3. Amita Kumari | Central-Teacher Eligibility Test |

35. Student progression (with in the University)

Table BES21: Data for student progression within University

Student Progression	Percentage against enrolled
UG to PG	-
PG to M.Phil	25%
PG to Ph.D	10%
Ph.D to Post-Doctoral	-
Employed <ul style="list-style-type: none">• Campus selection• Other than campus recruitment	25% 75%
Entrepreneurs	-

36. Diversity of staff

Table BES22: Diversity of staff in School of Biological and Environmental Sciences

Percentage of faculty who are graduates	
of the same University	9.09%
From other universities within the State	27.27%
From universities from other States	36.36%
From universities outside the country	27.27%

37. Number of faculty who were awarded M.Phil., Ph.D, D.Sc. and D.Litt. during the assessment period :1

- Sujata Bhattacharya Ph.D 2014

38. Present details of departmental infrastructural facilities with regard to

a) Library.

Yogananda library of Shoolini University is fully digitized and houses text books, reference books, journals, magazines and newspapers both in hard bound and as e-resource sufficient for academic and research requirements of the students. All the e-resources are available to the faculty and students through Learning Management System (LMS) and Knowledge Management System (KMS). Yogananda library has

subscription to a number of learning packages from EBSCO which includes more than a lakh e-books and ~9000 research journals etc.

In addition to central library each school has its own virtual library which is linked to the central library with a minimum physical books and journals. All the study material available in the central library can be easily used through school libraries. School library also contains thesis, dissertations, project reports etc.

Following is the study material related to Biology, Botany, Zoology, Environment Science, etc. are available through school library

- Total Books available: 5680 + more than 1 lakh e-books
- Journals: 48 + 9000 e-journals (combined science and technology and management)

School Library. The School maintains a small reference section. Developed as a Wi-fi Hotspot for ready access to subject specific e-Journals and KMS.

- b) Internet facilities for staff and students Wi-Fi, LAN, IT Lab
- c) Total number of class rooms 4
- d) Class rooms with ICT facility 4
- e) Students' laboratories 2
- f) Research laboratories 2

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

a) from the host institution/university

Table BES23: List of doctoral students from School of Biological and Environmental Sciences

Doctoral Students				
S. No.	Name of the student	Registration No.	Research Topic	Name of Guide
1	Ms. Arti	BOT-11-D-01	Effect of polyethylene glycol induced water stress on morphological, physiological and biochemical responses in <i>Fagopyrum esculentum</i> Moench.	Prof. Sunil Puri
2	Ms. Kumari Shikha	BOT-11-D-02	Impact of water-deficit stress and salinity stress on the seed germination and growth of <i>Oenothera biennis</i> .	Prof. Sunil Puri
3	Ms. Sayeeda Kousar	12-BOT-D-05	Studies on mycorrhizal endophytes and seed germination in some Himalayan orchids	Dr. Jagdeep Verma
4	Ms. Menaka Thakur	14-BOT-D-02	Drought stress alleviation using Plant Growth Promoting Rhizobacteria (PGPR) in medicinal plants of Western Himalaya	Dr. Sujata

b) from other institutions/universities:

**Table BES24: List of doctoral students from other institutes/
Universities**

Ph.D ZOOLOGY				
S. No.	Name of the student	Registration No.	Research Topic	Name of Guide
1	Ms. Rinku Arora	ZO-09-D-02	Genetic characterization of Goldan Masheer, <i>Torputitora</i> (Hamilton), using random amplified polymorphic DNA (RAPD) markers	Prof. JM Julka
2	Ms. Neetu Garg	ZO-10-D-01	Earthworm diversity and population dynamics in different land use systems of Yamuna Nagar District Haryana	
3	Ms.Alka Chandel	ZO-11-D-01	Distribution, Abundance and Seasonality of Benthic Macro-invertebrates of a Hill Stream	
4	Ms.Anjana Sharma	ZO-12-D-01	Diversity and distribution of Earthworms with special reference to their population dynamics in selected hilly land use systems of Northwest Himalaya	
5	Mr. Shakoor Ahmed	ZO-12-D-02	Diversity and distribution of Earthworms with special reference to their population dynamics in selected land use systems along and altitude gradient in mid Himalaya	
Ph.D BOTANY				
S. No.	Name of the student	Registration No.	Research Topic	Name of Guide
1	Ms. Kusum	BOT-09-D-01	Population and ecological analysis of some orchids of Himachal Pradesh and	Dr. Jagdeep Verma

			Biochemical studies on some polymorphic species	
2	Ms. Mamta Sharma	BOT-09-D-02	Withanolide production under abiotic stress in <i>Withania somnifera</i> and its herbicidal activity against <i>Parthenium hysterophorus</i> and <i>Lantana camara</i>	Prof. Sunil Puri
3	Ms. Rupinder Kaur	BOT-09-D-04	Carbon sequestration productivity and nutrient distribution monoculture and polyculture land use systems of sub-temperate midhills of Himachal Pradesh	
4	Ms. Amita	BOT-09-D-05	Identification of Molecular markers for Gender determination in <i>Populus ciliate</i>	Prof. PK Khosla
5	Ms. Sujata	BOT-09-D-06	Abiotic stress mediated consequences on antioxidant defense system and secondary metabolites in <i>Andrographis paniculata</i> Wall. Ex Nees	Prof. Sunil Puri
6	Ms. Rachana Verma	12-BOT-D-01	Study on antioxidant, antimicrobial property and mycorrhizal diversity of some ethnomedicinal plants of District. Shimla, HP	
7	Ms. Purna Bhardwaj	12-BOT-D-02	Intra- specific variation in Needle colour morphotypes and resin yield determination in <i>Pinus roxburghii</i>	Prof PK Khosla
8	Ms. Kranti Thakur	12-BOT-D-04	Floristic composition and phytosociology of Bandli Wildlife Sanctuary, Mandi, Himachal Pradesh.	Prof. Sunil Puri
9	Ms. Komal	12-BOT-D-06	Phytohormones induced morphological and phytochemical changes in <i>Fagopyrum esculentum</i> Moench.	
10	Ms. Bandhan Sharma	12-BOT-D-07	Assessment of heavy metals accumulation in agricultural crops around industrial area located in Himalayan foothills.	Dr. Sujata Bhattacharya

11	Ms. Manjul Sharma	13-BOT-D-02	Altitudinal variation of antioxidants and secondary metabolites profile in rhizome of <i>Hedychium spicatum</i> .	
12	Ms. Bindu Sharma	13-BOT-D-03	Ecological, Physical and socioeconomic impacts of Pandoga sub-watershed on rainfed agricultural area of Swan river catchment in Shivalik Hills	
13	Ms. Babina Devi	14-BOT-D-01	Course work	
Ph.D ENVIRONMENT SCIENCE				
S. No.	Name of the student	Registration No.	Research Topic	Name of Guide
1	Mr. Ravinder Singh Rathore	ENV-11-D-01	Solid waste and waste water management (SWM) for the protection of Arban environment: A case study of Shimla city, Himachal Pradesh, India.	Prof. PK Khosla
2	Ms. Navdeep Kaur	12-ENV-D-01	Quality assessment of surface ground water along Buddha Nallah in Punjab, India	Prof. Sunil Puri
3	Ms. Vanita Dhanotia	12-ENV-D-02	Geographical analysis on environmental factors, effecting qualities of drinking water and its impact on water-borne diseases among the rural population of Kangra district, Himachal Pradesh	Dr. Sujata Bhattacharya
4	Ms. Sharanjeet Kaur Kahlon	13-ENV-D-01	Ecological studies on the macro-invertebrates of a hill stream impacted by anthropogenic activities in Western Himalaya	Prof. JM Julka
5	Sarla Shashni	13-ENV-D-02	Ecotourism assessment, environmental impacts and sustainable management option in and around the Great Himalayan National Park, India	

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

Table BES25: List of PG students getting financial assistance from University

S. No.	Student Name	Course
1	Menaka Devi	M.Sc Botany
2	Mamta Sharma	M.Sc Botany
3	Ashutosh sharma	B.Sc-M.Sc (Hons)
4	Nikhil kaushal	B.Sc-M.Sc (Hons)
5	Deepali	B.Sc-M.Sc (Hons)
6	Chetali Chauhan	B.Sc-M.Sc (Hons)
7	Pankaj Kanwar	B.Sc-M.Sc (Hons)
8	Samriti Sharma	B.Sc-M.Sc (Hons)
9	Prerana Bhardwaj	Ph.D Botany

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

Yes, the need for new programs and courses is assessed from the time to time. Dean of the Faculty proposes new programs on basis of inputs from the stakeholders including the potential employers, academicians, faculty of the School and alumni. The proposal is put forward to Board of Studies which then assesses the need and based on their recommendations the proposal is forwarded to Academic Council for consideration.

42. Does the department obtain feedback from

**a) faculty on curriculum as well as teaching-learning-evaluation?
If yes, how does the department utilize the feedback?**

Yes, feedback is obtained from the faculty on curriculum as well as teaching, learning and evaluation on regular basis in the meetings of faculty, Board of Studies, and other similar forums and it is utilized as follows:

- During the Board of studies meeting for revision of curriculum the feedback from faculty is taken into consideration for the major modification.
- The comments from faculty from each specialization are given due weightage while designing the curriculum and syllabus.
- Faculty feedback has a major role for the design of practical training with provision for making availability of modern advance techniques and other required support.

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

Yes, students are involved to evaluate teachers through feedback forms on the teaching methodology, regularity in class by the teacher, understanding and extempore delivery of lectures etc. is taken. The feedback is shared with the faculty and staff to help them to improve the teaching skills. The feedback is also taken into consideration for improving the curriculum and teaching-learning-evaluation.

c) alumni and employers on the programs offered and how does the department utilize the feedback?

Yes, feedback is obtained from alumni and employers through formal and informal discussions on the programs offered regularly during their visits to the campus. The feedback is utilized in designing and revision of the curriculum based on the experience of alumni in their work places.

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

Many alumni after obtaining post-graduate and Ph.D degrees have been well placed in different organizations. Alumni who are on the path of success and have potential to be at the top position are listed below:

Table BES26: List of successful alumni

S. No.	Student Name	Course Studied	Year	Current Occupation Designation/Organization
1	Dr. Kusum Sharma	Ph.D Botany	2014	Assistant Professor, Shoolini Institute of Life Sciences and Business Management, Solan
2	Dr. Sujata Bhattacharya	Ph.D Botany	2014	Assistant Professor, Shoolini University, Bajhol, Solan
4	Sangeet Sharma	M.Phil Botany	2011	Lecturer, Swami Vishwataman and Sarswati College of Education, Sunderbani, Jammu and Kashmir
5	Milan Jain	M.Phil Botany	2012	Research Fellow, CRI, Kasauli
6	Shikha Sharma	M.Phil/Ph.D Botany	2011	Assistant Professor, SN College, Banga
7	Arti Jamwal	M.Phil/Ph.D Botany	2011	Assistant Professor, Career Point University, Hamirpur
8	Kapil	M.Sc Botany	2013	Lecturer, Vidyapeeth Coaching Centre, Shimla
9	Priyanka	M.Phil Environment Sciences	2012	Research Fellow, HPFRI, Shimla

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

The School of Biological and Environmental Sciences supports student enrichment activities aimed at bringing the excitement of science and scientific discovery to the students. These activities include several efforts in science internship programs, special coaching classes and expert lectures, with an overall goal of heightening student and teacher enthusiasm for the Biological and Environmental sciences and current research approaches. The components of the student enrichment programs include:

- INSPIRE Internship Programs
- NET coaching classes for M.Sc (Botany and Zoology)
- Guest lectures by following:

Table BES27: List of Guest Lecturers

S. No.	Name	Address
1	Prof. R.K. Kohli	Chairperson, Department of Botany, Panjab University, Chandigarh
2	Prof. S.P. Vij	Ex-Chairman Department of Botany, Panjab University, Chandigarh
4	Dr. (Mrs.) Avinash Kaur Nagpal	Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar, Punjab
5	Prof. Pallab Ray	Department of Medical Microbiology, PGIMER, Chandigarh
6	Prof. V.K. Kapoor	Dean Pharmacy, G.H.G. Khalsa, Gurusar Sadhar, Punjab
7	Prof. Rajendra Prasad	Jawaharlal Nehru University, Delhi
8	Prof. Javed Naim Agrewala	Institute of Microbial Technology (IMTECH), Chandigarh
9	Prof SP Khullar	Department of Botany, Panjab University, Chandigarh
10	Prof. Gopal Krishan	Department of Earth Sciences, Panjab University Chandigarh
11	Prof. MS. Mankotia	Sr Scientist, Regional Horticulture Research Station, Mashobra Shimla (HP)
12	Prof. Wajir	Sr Scientist, Regional Floriculture Research Station, Mashobra Shimla (HP)
13	Dr. Ranju Bansal	University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh
14	Dr. Aniruddha Chakraaborty	School of Basic Sciences, IIT Mandi (HP)
15	Prof. Subrata Gosh	School of Basic Sciences, IIT Mandi
16	Prof. CK Shirkot	Department of Basic Sciences, Dr. YS Parmar University, Nauni, Solan

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

The School of Biological and Environmental Sciences has been making the use of both traditional and modern teaching methodologies and online lectures under eUniv initiative. The online lectures serve as supplement to classroom teaching where students get free access to the study material, power point presentations, audio-visuals, video lectures etc. The communication and analytical skills of students are enhanced through seminar presentation by students. Research projects are also involved in the curriculum in both postgraduate and undergraduate programs to provide exposure in research. The detailed list of teaching methods include:

- **Lecture method:** Teaching is done by using the chalk and talk and power point presentations
- **Interactive Teaching:** The Interactive method includes audio-visual aids, live demonstrations with group discussion.
- **Project based learning:** The minor and major projects related to research work are done by U.G. and P.G. students
- **Lab and industrial visits:** Training in industries and R&D institutions is a mandatory part of course curriculum in undergraduate programs
- **Experimental learning:** The theoretical teaching concepts are supported by experimental learning as practicals.
- **Other Activities:** The subject related seminars, extempore, quizzes and assignments are given to U.G. and P.G. students

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

The School is committed to periodical evaluation of the various Programs offered to the students in terms of content, job market and students capability in securing a job. The progress in achieving the program objectives is periodically monitored by Board of Studies, faculty meetings, student interactions and interaction with other stake holders. The learning outcomes are monitored by continuous evaluation Program including:

- Internal evaluation
- Quizzes
- Surprise tests/Oral tests
- Tutorials
- Assignments
- Seminars
- Practical evaluation
- Viva-voce

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

Through the following programs, the faculty members and students are involved in the extension activities:

- “Swachh Bharat Abhiyan”, 2nd October 2014
- “National Drinking water and sanitation Awareness Day” on 19th March, 2015
- “Science Day” celebrations on 28th February, 2015
- “Earth Day” celebrations on 22nd April, 2015
- “Best from Waste” on Flower day 5th April, 2015
- Expert lectures in Biology in remote Schools of Himachal Pradesh
- Eco Club have been formed with active participation of faculty guides to promote environmental and biodiversity conservation activities e.g., tree plantation, solid waste management and other awareness programs

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

Beyond scholarly activities of School of Biological and Environmental Sciences include seminars, workshops, conferences, training programs, industrial visits, field visits, and invited talks etc. which are organized regularly to keep students aware of biological and environmental approaches. Other beyond scholarly activities include:

- SPRINT program for skill development and professional training
- Practical to participants of INSPIRE science camp
- Industrial and Institution visits
- NET coaching
- Student’s participation in extension work carried out by various clubs of the Shoolini University

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

None

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

- The School is actively engaged in generating new knowledge pertaining to the bioremediation of abiotic stress affected soils, cultivation and conservation of endangered plants with high medicinal values and bioactive compounds from plant origin.

- Other areas of research are taxonomy (classical, biochemical, molecular) and ecology (gross habitat types, substratum preferences, distribution pattern, threats) of Western Himalayan orchids. Also involved in mass propagation of commercially important and endangered orchid species through asymbiotic culture of seeds, and plantlet acclimatization for minimizing mortality rate during lab to land transfer.
- School of Biological and Environmental Sciences started Scholarship for Higher Education (SHE) of DST for top 1% toppers in 12th standard at their respective Board Examinations and organized 21 INSPIRE Internship Programs under Scheme for Early Attraction of Talent (SEATS) of DST since 2010 for exposure of students to Basic Sciences.

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

Strengths:

- The School of Biological and Environmental Sciences is the first in Himachal Pradesh to start Scholarship for Higher Education (SHE) of DST for 1% toppers in 12th standard of their respective Board Examinations pursuing courses in Natural and Basic Sciences at the B.Sc. or M.Sc. levels.
- The School took lead in Himachal Pradesh to organize INSPIRE Internship camps under the Scheme for Early Attraction of Talent (SEATS) of DST since 2010 and 21 such programs are organized till date.
- International exposure to students in academics and research under student exchange program.
- Research Publications with a focus on Himalayan biodiversity in high impact International Journals.
- Research projects in UG and PG are the important component of curriculum for generating scientific temper to the students.

Weaknesses:

- Need to improve research infrastructure to explore Himalayan biodiversity.
- School has limited external funding and need to focus on efforts to attract research grants and projects.
- Industrial collaborations need to be strengthened.
- Strengthening of collaborative research with institutions of repute to study biodiversity aspects of the Himalayan sustainability.
- Young faculty need to have international exposure.

Opportunities:

- Selection of quality genetic resources of the Himalayan region in relation to abiotic stresses, especially of endangered medicinal plants.
- Introduction of interdisciplinary and skill enhancement courses for UG and PG students in the upcoming areas of natural sciences such as molecular biology, cytotaxonomy, bioinformatics, biophysics etc. and enhancement for communication, analytical and entrepreneurial qualities.
- Generation of funding for the School in terms of projects from National and International funding agencies and to collaborate with industry for employment and research projects/trainings of students.
- NET/SLET special coaching classes for post-graduate students.
- Introduction of vocational courses in collaboration with NSDC.

Challenges:

- To excel at par with advance laboratories in relation to biological and environmental research.
- To seek collaborations for international research projects especially on sustainability and conservation of Himalayan biodiversity.
- To create better job opportunities and to develop innovative ideas for research.
- To motivate students to clear competitive examinations.
- To work in collaboration with industries and bridge the gap between industry expectations and technical skills of students.

52. Future plans of the department:

- **Exploration of Himalayan Biodiversity:**
The Himalaya's occupy a special place in the ecosystem of the World. These mountains are not only important from the standpoint of climate and as provider of life, giving water to a large part of country, but also harbor a rich variety of flora, fauna, humans and cultural diversity. In spite of the rich biodiversity, its human population still lives on subsistence level. There is a need to evolve new paradigm to understand its ecology and to establish repository of knowledge on the Himalayan flora and fauna. A comprehensive database of species and ecosystems and proper documentation of indigenous knowledge and practices to adaptation to climate change including quality genetic resources will be worked out. The School of Biological and Environmental Sciences, through set

up of advance research laboratories, will explore biodiversity from molecular to macro level.

- **Generation of Project Grants:**

Presently, the School has limited resources in the form of grants from different national and international funding agencies. In order to meet the aim of sustainable development of the Himalayas, the need is to boost up research activities which require strengthening of infrastructure facilities and manpower to meet the required goal. This can be met through extramural grants from national and international funding agencies, which the School will aim to get in near future.

- **Alliances:**

In order to strengthen the research and education activity in the School, the need is to strengthen alliances and collaborations with premier institutes, industries etc. at national and international level. All endeavors will be made by the School to strengthen up alliances for transfer to knowledge, student and faculty exchange, joint researches, conferences and training programs.

- **Centre of Excellence:**

Today the Himalayan ecosystem is threatened by various drivers of change such as human activities, agricultural expansion into the forest land and above all climate change. Problems like Green House Gas emissions; soil, water and air pollution; land use conversions, deforestation, land degradation etc., have already crept in the Himalayas. In order to take up these challenges, the School aims to set up a Research Centre on Climate Change.

- **Placement and extension activities:**

It is envisioned that graduate and post-graduate students be employed in the proper organizations so that their talents are utilized properly. The School will make all efforts to get them placed in reputable organizations. The School also plans to start vocational courses in the disciplines of landscape, floriculture, mushroom cultivation etc. for the skill development of students. There is lack of environment awareness in the population of Himalayas. The need is to create awareness through training camps, workshops, public meetings etc. to enable the local and rural populations about conservation and sustainable utilization of Himalayan resources. The School will attempt to organize these activities in different regions of Himachal Pradesh.

4. Evaluative Report of the School of Chemistry

The School of Chemistry endeavors to build up scholars of global competence by hands-on research exposure with sophisticated analytical instruments and providing adequate interaction with leading subject experts. Besides nurturing the students in basic chemistry, the School is also committed to provide a research based model in the upcoming thrust areas of green chemistry, natural chemistry, polymer chemistry, nano-chemistry etc. In the alignment with the vision of Shoolini University, the students in UG, PG and research programs also get a chance to get into the interface of biology, biotechnology and other applied sciences. The teaching methodology is equipped with innovative technologies like eUniv, ERP for utmost competence at global fraternity.

The School has nationally and internationally acclaimed faculty members who have several years of experience in research and teaching. The outcome of the programs enhances the quality, confidence and research attitude of the students and thus, increases the employment prospective in research organization, teaching and industry. The students from the School are placed in reputed industrial organization and teaching positions. As part of its ongoing effort the School of Chemistry is committed to both basic and applied research with a special emphasis for the exploration of Himalayan resources as sustainable chemistry for value addition. The School has generated funds from Board of Research in Nuclear Sciences and Department of Science and Technology, Govt. of India.

1. Name of the Department: School of Chemistry

2. Year of establishment: 2010

3. Is the Department part of a School/Faculty of the university?

Yes, School of Chemistry is a part of the Faculty of Basic Sciences.

4. Names of programs offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.):

School of Chemistry offers following programs:

- B.Sc. (Hons) in Chemistry
- B.Sc. (Hons)-M.Sc. Dual Degree in Chemistry
- M.Sc. in Chemistry
- M.Sc. in Pharmaceutical Chemistry
- M.Phil. in Chemistry
- Ph.D. in Chemistry

5. Interdisciplinary programs and departments involved :

a) Interdisciplinary Joint Programs

School of Chemistry runs interdisciplinary program in M.Sc. Pharmaceutical Chemistry as listed below:

Table CH01: Joint programs run by School of Chemistry with other School

S. No.	Program	School
1.	M.Sc. Pharmaceutical Chemistry	School of Pharmaceutical Sciences

b) School of Chemistry programs supported by other Schools

The School of Chemistry has diversified its curriculum and sought expertise from other Schools in the university. Following is the list of other Schools involved in the teaching:

Table CH02: List of chemistry programs supported by other Schools.

S. No.	Programs	Schools
1.	B.Sc. (Hons)- M.Sc. Dual Degree	School of Physics & Materials Science, School of Biological and Environmental Sciences, School of Business Management and Liberal Arts
2.	M.Sc.	School of Biological and Environmental Sciences, School of Mechanical and Civil Engineering
3.	Ph.D.	School of Electrical and Computer Science Engineering, School of Business Management and Liberal Arts

6. Courses in collaboration with other universities, industries, foreign institutions, etc.:

School of Chemistry has collaboration for student exchange program with Gachon University and Suwon University, South Korea for UG curriculum. School has also kept the flexibility for Ph.D. guidance and provides co-guide from NITs and other research institutes for interdisciplinary approach. The objective of the collaboration is to generate comprehensive competence among students and employability in research organizations.

- B.Sc. (Hons)-M.Sc. Dual Degree (Chemistry) Program in collaboration with Gachon University and Suwon University, South Korea for one semester.
- Ph.D. Chemistry in collaboration with NIT Hamirpur, NIT Jalandhar, Punjabi University, Patiala, G.B. Pant Institute of Himalayan Environment & Development Himachal Unit, Mohal-Kullu etc.

7. Details of programs discontinued, if any, with reasons Nil

8. Examination System:

- School of Chemistry has been following the semester system and OCPA/OGPA grading system for UG, PG, M. Phil. and Ph.D. programs.
- In accordance with the recommendations of UGC, university has adopted Choice Based Credit System w.e.f. 2015-16 academic session.

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

The School is actively involved in the courses run by other Schools. Following is the list of courses taught by School of Chemistry in other Schools.

Table CH03: List of courses taught by School of Chemistry in the courses offered by other Schools

Courses	Programs	Schools
Introductory Chemistry, Chemical Transformations, Solution Chemistry	B.Sc. (Hons)-M.Sc. Dual Degree (Botany and Zoology)	School of Biological & Environmental Sciences
Introductory Chemistry, Chemical Transformations, Solution Chemistry	B.Sc. (Hons)-M.Sc. Dual Degree (Physics)	School of Physics and Materials Science
Introductory Chemistry	B. Sc. (Hons) Biotechnology/ B. Sc. (Hons) Microbiology	School of Biotechnology
Engineering Chemistry	B. Tech Biotechnology B. Tech Food Technology	School of Bioengineering & Food Technology

Courses	Programs	Schools
Engineering Chemistry, Environmental Science	B. Tech Mechanical Engineering B. Tech Civil Engineering M. Tech Environment Science	School of Mechanical & Civil Engineering
Engineering Chemistry	B. Tech Electrical Engineering B. Tech Electronics and Communication Engineering B. Tech Bioinformatics	School of Electrical & Computer Science Engineering
Organic Chemistry	B. Pharmacy	School of Pharmaceutical Sciences

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

Following are the posts sanctioned and filled in School of Chemistry as per UGC norms:

Table CH04: Posts sanctioned and filled as per UGC norms.

Teaching Post	Sanctioned	Filled /Actual (including CAS & MPS)
Professor	02	01
Associate Professor	04	02
Assistant Professor	06	06

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

The School of Chemistry has nationally and internationally acclaimed faculty who have several years of experience from academia and industry. The detailed faculty profile has been given below:

Table CH05: List of faculty members for School of Chemistry

Name	Qualification	Designation	Specialization	Years of Experience	Ph.D./M.Phil students guided for the last 4 years
Dr. Deepak Pathania	Ph.D.	Professor	Organic Chemistry	15	Ph.D. – 05 M.Phil. – 10
Prof. Ramanand Chauhan	M.Sc.	Associate Professor	Inorganic Chemistry	35	-
Dr. Kalpana Chauhan	Ph.D.	Associate Professor	Organic Chemistry	7	Ph.D. – 01 M.Phil. – 11
Dr. Pradeep Singh	Ph.D.	Assistant Professor	Physical Chemistry	4.5	M.Phil. -07
Dr. Amit Kumar	Ph.D.	Assistant Professor	Physical Chemistry	4	M.Phil. -01
Dr. Neeraj Gupta	Ph.D.	Assistant Professor	Organic Chemistry	3	M.Phil. – 03
Dr. Pankaj Thakur	Ph.D.	Assistant Professor	Physical Chemistry	5	-
Dr. Pankaj Raijada	Ph.D.	Assistant Professor	Inorganic Chemistry	3	M.Phil. - 03
Dr. Gaurav Sharma	Ph.D.	Assistant Professor	Organic Chemistry	1	-

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

To infuse subject and analytical expertise among students for global competence, the School of Chemistry involves Visiting Fellow and Visiting Professor to train the students in thrust areas. Following is the list of Visiting Fellow and Visiting Professors for School of Chemistry:

Table CH06: List of visiting faculty and professor of eminence for School of Chemistry.

S. No.	Category	Name	Organization
1.	Professor of Eminence	Prof. P.S. Kalsi	Former HOD Chemistry, Punjab Agricultural University, Ludhiana, Punjab, India
2.	Visiting Professor	Prof. S.S. Bari	Professor, Department of Chemistry, Panjab University, Chandigarh
3.	Visiting Professor	Prof. S.K. Sharma	Professor, Department of Chemistry, Himachal Pradesh University, Shimla
4.	Visiting Fellow	Mr. M.L. Sharma	Consultant ICON Ltd., Mumbai

13. Percentage of classes taken by temporary faculty – program-wise information: Nil

14. Program-wise Student Teacher Ratio:

- UG : 14:1
- PG : 9:1

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

Table CH07: Detail for academic support and administrative staff.

Staff	Sanctioned	Actual
Technical	01	01
Lab Attendants	03	02

16. Research thrust areas as recognized by major funding agencies

The School of Chemistry is actively engaged in the area of sustainable chemistry to solve the issues related to the need of alternative green materials and clean environment. In continuing its research efforts in sustainable chemistry, the School succeeded in generating research grant from different national organizations. The detailed list for the main research thrust areas is as follows:

- Green/ sustainable chemistry- Synthesis and characterization of alternative green materials by novel approach.
- Innovative Nano-materials or Photo-catalysis for water purification.
- Heterocyclic chemistry: Biomass conversion into value added chemicals.

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

a) National: 03

Faculty from the School has succeeded in getting grants from different national agencies in the areas of today's big concern i.e. water purification and sustainable materials. Following are the list of projects granted by different funding agencies in the School of Chemistry:

Table CH08: List of ongoing projects.

S. No.	Title of the Project	PI and Co PI	Funding agency	Duration	Amount (Lakhs)
1.	Chitosan-thiomer, sulphide and sulphonium salt particulates in arsenic Detoxification	Dr. Kalpana Chauhan	BRNS	2014-17	23.21
2.	Photocatalytic activity of ternary metal for water purification (CS-128/2013)	Dr. Pardeep Singh	DST	2014-17	25
3.	Developing sustainable process for converting cellulose to 5-Hydroxymethyl furfural (5-HMF) by synthesizing Indium based catalyst; and its conversion into value added chemicals	Dr. Neeraj Gupta	DST	2013-16	17

b) International funding agencies: Nil

c) Total grants received: Three grants from different organizations worth Rs. 65.21 Lakhs

18. Inter-institutional collaborative projects and associated grants received :

a) National collaboration:

School has collaborations with national and international research institutes and NITs to encourage high-level research of global competence.

Following is the list of collaborative projects initiated with different institutes:

Table CH09: List of inter-institutional national collaborations

S. No.	PIs	Collaborator	Name of the Project	Grant Received (Rs.)
1.	Dr. Deepak Pathania	Prof. A.S. Singha Department of Chemistry NIT, Hamirpur (H.P)	Fiber Reinforced Polymer Based Composites	50,000
2.	Dr. Deepak Pathania	Prof. N.C. Kothiyal, Department of Chemistry NIT, Jalandhar (Punjab)	Nano-composites	50,000
3.	Dr. Kalpana Chauhan	Dr. J.C. Kuniyal Scientist-E, G.B. Pant Institute of Himalayan, Environment & Development, HP Unit, Mohal-Kullu, India	Atmospheric Chemistry in the Kullu Valley, Northwestern India Himalaya	1,00,000

b) International collaboration:

Table CH10: List of inter-institutional international collaborations

S. No.	PIs	Collaborator	Name of the Project	Grant Received (Rs.)
1.	Dr. Deepak Pathania	Prof. Ajay Kumar Mishra, Professor , Nanotechnology and Water Sustainability Research Unit, College of Engineering, Science and Technology, University of South Africa, Florida Science Campus, Johannesburg	Nanotechnology and Water Sustainability	1,00,000
2.	Dr. Deepak Pathania	Prof. Z.M. Siddiqi Department of Basic Sciences, Jubail University College, Jubail University, Saudi Arabia	Composite ion exchange for diverse applications	1,00,000

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

The School has submitted a DST-FIST project (Rs. 2.85 crore) for high-tech research lab.

20. Research facility /centre with

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

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

22. Publications (Last 5 year):

- Number of papers published in peer reviewed journals (national/international) : 92
- Monographs: : Nil
- Chapters in Books: : 02
- Edited Books: : Nil
- Books with ISBN with details of publishers: : Nil
- Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.):
- Citation Index – range / average : 1-547
- SNIP (Source Normalized Impact per Paper) : 1.7
- SJR (Scientific Journal Ranking) : 1.51
- Impact Factor – range/average : 0.2-6/2.44
- h-index : 12

List of publications:

1. Bharati B, Kalia S, Kumar S, Kumar A, Mittal H. Surface Functionalization of Sisal Fibers using Peroxide Treatment Followed by Grafting of Poly(ethyl acrylate) and Copolymers. *Int. J. Polym. Anal. Charact.* 2013, **18**:596-607. (IF:1)
2. Bhardwaj P, Kalia S, Kumar A, Mittal H. Peroxide treatment of soy protein fibers followed by grafting of poly(methyl acrylate) and copolymers. *J. Renew. Mater.* 2014, **1(4)**: 302-310.
3. Chauhan A, Kaith BS, Singha AS, and Pathania D, Induction of Morphological changes in Hibiscus Sabdariffa graft copolymerization with acryl nitrate and co-vinyl monomers in binary mixture. *Malay. Polym. J.* 2010, **5**:140-150. (IF: 0.4).
4. Chauhan K, Chauhan GS, Ahn JH. Novel polycarboxylated starch based sorbents for Cu²⁺ ions. *Ind. Eng. Chem. Res.* 2010, **49**:2548-2556 (IF: 2.25)

5. Chauhan K, Chauhan GS, Ahn JH. Synthesis and characterization of novel guar gum hydrogels and their use as Cu²⁺sorbents. *Bioresour. Technol.* 2009, **100**:3599-3603 (IF: 5.60)
6. Chauhan K, Chauhan GS. Polycarboxylated biopolymers as stimuli sensitive carriers for insulin drug delivery. *Trends Carbohydr. Res.* 2011, **3**:33-41.
7. Chauhan K, Chauhan GS. Separation of Uranyl Ions on Starch-Based Functional Hydrogels: Mechanism and Kinetics. *Sep. Sci. Technol.* 2011, **46**:172-178 (IF: 1.2)
8. Chauhan K, Kumar R, Kumar M, Sharma, P, Chauhan GS. Modified pectin based polymers as green antiscalants for calcium sulphate scale inhibition. *Desalination.* 2012, **305**:31-37 (IF: 3.96)
9. Chauhan K, Patiyl P, Chauhan GS, Sharma P. Bio-inspired star-shaped polymers of alga core in inhibition and dissolution of silicate. *Water Res.* 2014, **56**:225-233. (IF: 6)
10. Dhiman P, Chand J, Kumar A, Kotnala RR, Batoo KM, Singh M. Synthesis and characterization of novel Fe@ZnO nanosystem. 2013, *J. Alloy. Compd.* **578**:235-241. (IF: 2)
11. Gupta D, Singh D, Kothiyal NC, Saini AK, Pathania D. Microwave induced synthesis of chitosan-g-poly(acrylamide)/ZnS nanocomposite for controlled drug delivery and antimicrobial activity. *Int. J. Biol. Macromol.* 2014, **74**:547-557. (IF: 3.2).
12. Gupta VK, Agarwal S, Pathania D. acrylic acid grafted Luffa *Cylindrica* fiber for the removal of dye and metal ions, *Carbohydr. Polym.* 2013, **98**: 1214-1221. (IF: 4.33)
13. Gupta VK, Agarwal S, Tyagi I, Pathania D, Rathore BS, Sharma G. Synthesis, characterization and analytical application of cellulose acetate-tin (IV) molybdate nanocomposite ion exchanger: binary separation of heavy metal ions and antimicrobial activity. *Ionics*, 2014 *In press*. DOI: 10.1007/s11581-015-1368-4 (IF: 1.836)
14. Gupta VK, Agarwala S, Pathania D, Kothiyal NC, Sharma G. Use of pectin–thorium (IV) tungstomolybdate nanocomposite for photocatalytic degradation of methylene blue. *Carbohydr. Poly.* 2013, **96**: 277- 283. (IF: 4.330)
15. Gupta VK, Pathania D, Sharma S. Removal of Cr (VI) onto Ficus *Carica* biosorbent from water. *J. Environ. Poll. Res.* 2013, **20**:2632-2644. (IF 2.8)
16. Gupta VK, Pathania D, Kothiyal NC, Sharma G. Polyaniline zirconium (IV) silicophosphate nanocomposite as absorbent for removal of methylene blue dye from waste-water. *J. Mol. Liquid.* 2014, **190**:139-145. (IF: 2.083).
17. Gupta VK, Pathania D, Priya B, Singha AS, Sharma G. Microwave induced synthesis of graft copolymer of binary vinyl monomer

- mixtures onto delignified *Grewia optiva* fibre: Application in dye removal. *Frontiers in Chemistry*. **Anal. Chem.** 2014, 2:1-8.
18. Gupta VK, Pathania D, Saleh TA, Sharma G. Liquid phase synthesis of pectin–cadmium sulfide nanocomposite and its photocatalytic and antibacterial activity. **J. Mol. Liq.** 2014, **196**: 107-112. (IF: 2.083)
 19. Gupta VK, Pathania D, Sharma S, Singh P. Preparation of bio-based porous carbon by microwave assisted H_3PO_4 activation and its use for adsorption of Cr (VI). **J. Colloid Interface Sci.** 2013, **401**:125-132. (IF: 3.58)
 20. Gupta VK, Pathania D, Sharma S, Agarwal S, Singh P. Remediation and recovery of azo dye from aqueous solution onto acrylic acid grafted *Ficus carica* fiber: Isotherms, Kinetics and thermodynamics. **J. Mol. Liq.** 2013, **177**:325-335. (IF 2.08)
 21. Gupta VK, Pathania D, Sharma S. Adsorptive remediation of Cu(II) and Ni(II) by microwave-assisted H_3PO_4 activated carbon. **Arb. J. Chem.** 2015, In Press. Doi:10.1016/j.arabjc.2013.11.006 (IF: 2.68).
 22. Gupta VK, Pathania D, Sharma S. Amputation of congo red dye from waste water using microwave induced grafted *Luffa cylindrica* cellulosic fiber. **Carbohydr. Polym.** 2014, **111**: 556-566. (IF: 4.33).
 23. Gupta VK, Pathania D, Singh P, Kumar A, Rathore BS. Adsorptional removal of methylene blue by gum based cerium (IV) tungstate hybrid cation exchanger. **Carbohydr. Polym.** 2014, **101**:684-691. (IF: 4.33).
 24. Gupta VK, Pathania D, Singh P, Rathore BS, Chauhan P. Cellulose acetate-zirconium (IV) phosphate nanocomposite ion exchanger with photocatalytic activity. **Carbohydr. Polym.** 2013, **95**:434-440. (IF 4.33)
 25. Gupta VK, Pathania D, Singh P. Adsorptional photocatalytic degradation of methylene blue onto pectin-CuS nanocomposite under solar light. **J. Hazard. Mater.** 2012, **243**:179-186. (IF 4.55).
 26. Gupta VK, Pathania D, Singh P. pectin–cerium (IV) tungstate nanocomposite and its adsorptional activity for the removal of methylene blue dye. **Intern. J. Environ. Sci. Tech.** 2014, **11**: 2015-2024. (IF: 1.7).
 27. Gupta VK, Saleh TA, Pathania D, Rathore BS, Sharma G. A cellulose acetate based nanocomposite for photocatalytic degradation of methylene blue dye under solar light. **Ionics**, 2014, **21**: 1787-1793. (IF: 1.836)
 28. Gupta VK, Sharma G, Pathania D, Kothiyal NC. Nanocomposite pectin Zr (IV) selenotungstophosphate for adsorptional / photocatalytic remediation of methylene blue and malachite green

- dyes from aqueous system, *J. Ind. Eng. Chem.* 2015, **21**:957-964. (IF: 2.1)
29. Jamwal D, Kaur G, Raizada P, Singh P, Pathak D, Thakur P. Twin-tail surfactant peculiarity in superficial fabrication of semiconductor quantum dots: toward structural, optical and electrical features. *J. Phy. Chem. C* 2015, **119**: 5062-5073. (IF: 4.8)
 30. Kalia S Kango S, Kumar A, Haldorai Y, Kumar R. Magnetic Polymer Nanocomposites for Environmental and Biomedical Applications. *Colloid. Polym. Sci.* 2014, **292**: 2025-2052. (IF: 2.161)
 31. Kalia S Sharma K, Kumar A, Celli A. Laccase-assisted surface functionalization of lignocellulosics. *J. Mol. Catal. B.* 2014, **102**:48-58. (IF:2.8)
 32. Kalia S, Sheron R, Mittal H, Kumar A. Surface modification of Ramie fibres using microwave assisted graft copolymerization followed by *Brevibacillus paravbrevis* pretreatment. *Adv. Mater. Lett.* 2013, **4**:742-748. (IF:1.93)
 33. Kango S, Kalia S, Thakur P, Kumari B, Pathania D. Semiconductor–Polymer Hybrid Materials. *Adv. Polym. Sci.* 2015, **267**:283-312. (IF: 3.2)
 34. Kant S, Kumar A, Kumar A. Molar volume, viscosity and conductance studies of some alkali metal chlorides in aqueous ascorbic acid. *J. Mol. Liquid.* 2009, **150**:39-42. (IF: 2.083)
 35. Kothiyal NC, Pathania D, Chauhan C. Remediation of Cr (VI) by low cost adsorbents and synthetic inorganic ion exchanger: A comparative Study. *Electron. J. Environ. Agric. Food Chem.* 2011, 1900-1912. (IF: 0.6).
 36. Kumar A, Shashi K , Pathania D, Singh P, Dhiman P. Removal of malachite green and methylene blue by $\text{Fe}_{0.01}\text{Ni}_{0.01}\text{Zn}_{0.98}\text{O}$ /polyacrylamide nanocomposite using coupled adsorption and photocatalysis. *Appl. Catal. B: Environ.* 2014, **147**: 340-352. (IF: 6.423)
 37. Kumar A, Sharma G, Naushad M, Kalia S, Singh P. Polyacrylamide/ $\text{Ni}_{0.02}\text{Zn}_{0.98}\text{O}$ nanocomposite with high solar light photoacatalytic activity and efficient adsorption capacity for toxic dyes removal. *ACS Ind. Eng. Chem. Res.* 2014, **53**: 15549–15560 (IF: 2.235)
 38. Kumar A, Sharma G, Naushad M, Thakur, S. SPION/ β -cyclodextrin core-shell nanostructures for oil spill remediation and organic pollutant removal from waste water. *Chem. Eng. J.* 2015, **280**: 175-187. (IF: 4.1)
 39. Kumar P, Kumar A, Chauhan K, Gupta R, Ahn JH. Removal of As (V) from water by pectin based active hydrogels following

- geochemical approach. *Bioresour. Technol.* 2009, **100**:1474-1477 (IF: 5.60)
40. Naushad M, ALOthman ZA, Sharma G, Inamuddin. Kinetics, isotherm and thermodynamic investigations for the adsorption of Co (II) ion onto crystal violet modified amberlite IR-120 resin. *Ionics*, 2014, **21**: 1453-1459 (IF: 1.836)
 41. Pare B, Kamal N, Singh P, Vijay R, Bhagwat VW. Ru (III) as catalyst for the oxidative degradation of triarylmethane dye using acidic chlorite. *Int. J. Chem. Sci.* 2009, **7**: 2063-2070. (IF: 0.13)
 42. Pare B, Singh P, Jonnalagadda SB. Effect of operational parameters on the ZnO and visible light assisted photocatalytic degradation of lissamine fast yellow dye in a slurry batch reactor. *Ind. J. Chem. Sec. A.* 2009, **48**: 1364-1369. (IF: 0.6)
 43. Pare B, Singh P, Jonnalagadda SB. Photo-assisted decolourisation of a triarylmethane dye in aqueous suspension of ZnO under visible irradiation- A case study of photooxidation of victoria blue B dye. *J. Sci. Ind. Res.* 2009, **68**: 724-729. (IF: 0.5)
 44. Pare B, Singh P, Jonnalagadda SB. Photodegradation of safranine-O dye using visible irradiation and aqueous suspension of ZnO in a slurry batch reactor. *J. Ind. Chem. Soc.* 2010, **87**: 1359-1368. (IF: 0.25)
 45. Pare B, Singh P. Reduction in chemical oxygen demand and color intensity of dye contaminated wastewater using visible light and ZnO assisted advanced oxidation processes-a green laboratory experiment for wastewater. *Chem. Edu. In ICT age-Spr.* 2010, 225-234.
 46. Pathania D, Gupta VK, Sharma S. Decolorization of hazardous dye from water system using chemical modified Ficus carica adsorbent. *J. Mol. Liq.*, 2012, **174**:86-94. (IF: 2.0).
 47. Pathania D, Kalia S, Sharma R. Graft Copolymerization of Acrylic Acid onto Gelatinized Potato Starch for the Removal of Metal Ions and Organic Dyes from Aqueous System, Accepted. *Adv. Mater. Lett.* 2012, 3(2): 259-264. (IF: 2.06).
 48. Pathania D, Kashma, Priya B. Study of morphology of graft copolymer of methacrylic acid onto cellulosic fibres using Electron microscopy. *Int. J. Theo. Appl. Sci.* 2011, **4**: 36-42.
 49. Pathania D, Nausad M, Sharma G, Priya V. A biopolymer based hybrid cation exchanger pectin cerium (IV) iodate: Synthesis, characterization and analytical applications. *Desalin. Water Treat.* 2015. In Press. DOI:10.1080/19443994.2014.967731 (IF: 1.0)
 50. Pathania D, Priya B, Singha AS. Synthesis and kinetics of ascorbic acid initiated graft copolymerized delignified cellulosic fibre. *Polym. Eng. Sci.* 2015, **55**: 474-482. (IF: 1.9)

51. Pathania D, Rathore BS. Styrene-tin (IV) phosphate nanocomposite for photocatalytic degradation of organic dye in presence of visible light. *J. Alloy. Compd.* 2014, **606**:105-111. (IF: 2.79)
52. Pathania D, Sarita, Rathore BS. Synthesis, Characterization and photocatalytic application of Bovine Serum Albumin capped CdS nanoparticles. *Chalcogenide Lett.* 2011, **204**:396 - 404.
53. Pathania D, Sarita, Singh P, Pathania S. Preparation and characterization of nanoscale cadmium oxide using bovine serum albumin as green capping agent and its photocatalytic activity. *Desalin. Water Treat.* 2014, **52**: 3497-3503.(IF: 1.2)
54. Pathania D, Sharma G, Kumar A, Kothiyal NC. Fabrication of nanocomposite polyaniline zirconium (IV) silicophosphate for photocatalytic and antimicrobial activity. *J. Alloy. Compd.* 2014, **588**:668-675. (IF: 2.79).
55. Pathania D, Sharma G, Naushad M, S. Kalia, AL Othman ZA. Combined sorptional-photocatalytic remediation of dyes by polyaniline Zr (IV) selenotungstophosphate nano composite. *Toxicol. Environ. Chem.* 2015, *In press*. DOI:10.1080/02772248.2015.1050024 (IF: 0.723)
56. Pathania D, Sharma G, Naushad Mu, Kumar A. Synthesis and characterization of a new nanocomposite cation exchanger polyacrylamide Ce(IV) silicophosphate: Photocatalytic and antimicrobial applications. *J. Ind. Eng. Chem.* 2014, **20**:3596-3603. (IF: 2.1).
57. Pathania D, Sharma G, Thakur R. Pectin@ zirconium (IV) silicophosphate nanocomposite ion exchanger: Photo catalysis, heavy metal separation and antibacterial activity. *Chem. Eng. J.* 2015, **267**: 235-244. (IF: 4.1)
58. Pathania D, Sharma R. Synthesis and characterization of graft copolymers of methacrylic acid onto gelatinized potato starch using chromic acid initiator in presence of air. *Adv. Mater. Lett.* 2012, **3**:136-142. (IF: 2.06).
59. Pathania D, Sharma S, Singh P. Removal of methylene blue by adsorption onto activated carbon developed from *Ficus Carica* bast. *Arabian J. Chem.* 2013, *In press*. Doi:10.1016/j.arabjc.2013.04.021 (12-00357). (IF: 2.68)
60. Pathania D, Sharma S. Effect of surfactants and electrolyte on removal and recovery of basic dye by using *Ficus carica* cellulosic fibers as biosorbent. *Tenside Surfact. Det.* 2012, **4**:306-314. (IF: 1.2).
61. Pathania D, Singh D, Singh D. Electrical properties of natural fiber graft co-polymer reinforced phenol formaldehyde composites. *J. Optoelectron. Adv Mat.* 2010, **4**:1048-1051. (IF: 0.8).

62. Pathania D, Singh P, Siddiqi ZM. Separation and estimation of heavy metals on zeolitic material synthesized from fly ash by chemical modification. *Ion Exch. Lett.* 2013, 1-4.
63. Priya B, Gupta VK, Pathania D, Singha AS. Synthesis, characterization and antibacterial activity of biodegradable corn starch/poly (vinyl alcohol) composite films reinforced with cellulosic fibre. *Carbohydr. Polym.* 2014, **109**:171-189. (IF: 4.33).
64. Raizada P, Sharma U, Vyas V, Sharma, P. Extraction and transport of some amino acids using kryptofix 5 as receptor through liquid membrane. *J. Chem.* 2013, **2013**: 1-4. (IF:0.6)
65. Raizada P, Sharma U. Extraction and facilitated membrane transport studies of some biologically important metal ions using redox switched ionophore. *Main Group Metal Chem.* 2010, **33**:321-326. (IF:0.5)
66. Raizada P, Sharma U. Liquid membrane extraction and transport of amino acids using calix [6]arene. *Ind. J. Chem. Technol.* 2010, **17**:267-273. (IF: 0.2)
67. Raizada P, Singh P, Pare B, Jonnalgadda SB. Solar photocatalytic activity of nano-ZnO supported on activated carbon or brick grain particles: Role of adsorption in dye degradation. *Appl. Catal. A.* 2014, **486**: 159-169. (IF:3.9)
68. Raizada P, Singh P, Pare B, Jonnalgadda SB. Zero valent iron-brick grain nanocomposite for enhanced solar-Fenton removal of malachite green. *Sep. Purif. Technol.* 2014, **133**:429-437. (IF:3.5)
69. Raizada P, Tomar J, Sharma U. Design and synthesis of series of receptors and their use in extraction and liquid membrane transport studies of amino acids. *J. Ind. Chem. Soc.* 2011, **88**: 505-511. (IF:0.3)
70. Raizada P. Sharma U. Extraction and carrier facilitated membrane transport studies of some biologically important metal ions (Na^+ , K^+ & Ca^{2+}) using redox switched ionophore. *J. Ind. Chem Soc.* 2011, **89**: 508-511. (IF:0.3)
71. Rana M, Kumari A, Chauhan GS, Chauhan K. Modified chitosan microspheres in non-aggregated amylase immobilization. *Int. J. Macromol.* 2014, **66**:46-51. (IF: 3.2)
72. Rathore BS, Gupta VK, Sharma G and Pathania D. Synthesis, characterization and antibacterial activity of cellulose acetate-tin (IV) phosphate nanocomposite, *Carbohydr. Polym.* 2013, **103**:221-227. (IF: 4.33)
73. Rathore BS, Sharma G, Pathania D. Photocatalytic activity of cellulose acetate-tin (IV) molybdate nanocomposite in solar light. *SMC Bull.* 2013, **4**(3):11-16.
74. Sharma G, Naushad M, Pathania D, Mittal A, El-desoky G.E. Modification of Hibiscus cannabinus fiber by graft

- copolymerization: application for dye removal. *Desalin. Water Treat.* 2015, **54**: 3114-3121. (IF: 0.9)
75. Sharma G, Pathania D, Nausad M. Preparation. Characterization and ion-exchange behaviour of nanocomposite polyaniline zirconium (IV) selenotungstophosphate for separation of toxic metals. *Ionics*, 2015, **21**: 1045-1055. (IF: 1.839).
 76. Sharma G, Pathania D, Naushad M, Kothiyal NC. Fabrication, characterization and antimicrobial activity of polyaniline Th(IV) tungstomolybdophosphate nanocomposite material: Efficient removal of toxic metal ions from water. *Chem. Eng. J.* 2014, **251**:413-421. (IF: 4.1)
 77. Sharma G, Pathania D, Naushad M. Preparation, characterization and antimicrobial activity of biopolymer based nanocomposite ion exchanger pectin zirconium (IV) selenotungstophosphate: Application for removal of toxic metals. *J. Ind. Eng. Chem.* 2014, **20**: 4482-4490. (IF: 2.1)
 78. Sharma S, Kaur J, Sharma G, Thakur KK, Chauhan GS, Chauhan K. Preparation and characterization of pH-responsive guar gum microspheres. *Int J. Macromol.* 2013, **62**:636-641. (IF: 3.2)
 79. Sharma S, Pathania D and Singh P, Preparation, characterization and Cr (VI) adsorption behavior study of poly (acrylic acid) grafted Ficus carica bast fiber. *Adv. Mater. Lett.* 2013, **4**:271-276.(IF:1.9)
 80. Sharma S, Rana M, Thakur S, Chauhan K. Guar gum Microspheres as Prospective Carrier for Biotechnological Drugs. *Int. J. Eng. Res. Technol.* 2013, 84-85.
 81. Shashi K, Kalia S, Kumar A. A novel nanocomposite of Polyaniline and $\text{Fe}_{0.01}\text{Ni}_{0.01}\text{Zn}_{0.98}\text{O}$: Photocatalytic, Electrical and Antibacterial Properties. *J. Alloy. Compd.* 2013, **578**: 249-256. (IF:2.726)
 82. Shashi K, Kumar A, A comparative analysis of structural, optical and photocatalytic properties of ZnO and Ni doped ZnO nanospheres prepared by sol gel method. *Adv. Mater. Lett.* 2012, **3**:350-354. (IF: 1.93)
 83. Singh M, Kumar A, Dhiman P. Solution combustion preparation of Fe_2O_3 Nano flakes: synthesis and Characterization. *Adv. Mater. Lett*, 2012, **3**: 330-333. (IF:1.93)
 84. Singh P, Pathania D, Raizada P, Sharma P. Microwave induced KOH activation of guava peel carbon as an adsorbent of congo red dye removal from aqueous phase. *Ind. J. Chem. Tech.* 2013, **20**: 305-311. (IF: 0.58)
 85. Singh P, Raizada P and Sharma P, Microwave assisted KOH activation of guava peel based carbon for the removal of congo red dye from aqueous phas. *Indian J. Chem. Technol.* 2013, **20**; 305-315. (IF: 0.7)

86. Singh P, Raizada P, Kumar S, Kumar A, Pathania D. Solar-Fenton removal of malachite green with novel Fe⁰-activated carbon nanocomposite. *Appl. Catal. A*. 2014, **476**:9- 18. (IF: 4.02)
87. Singh P, Raizada P, Pathania D, Kumar A, Thakur P. Preparation, of BSA-ZnWO₄ nanocomposites with enhanced adsorptional photocatalytic activity for methylene blue degradation. *Inter. J. Photochem.* 2013, **726250**:1-7. (IF: 2.8)
88. Singh P, Raizada P, Pathania D, Thakur P. Preparation of pectin-ZnWO₄ nanocomposite with enhanced adsorptional and photocatalytic activity. *Inter. J. Phot.* 2013, **2103**: 1- 7. (IF:2.7)
89. Singha AS, Priya B, Pathania D. Analysis and characterization of microwave irradiation- induced graft copolymerization of methyl methacrylate onto deilignified Grewia optiva fibre. *Int. J. Polym. Anal. Character.* 2014, **19**: 115-123. (IF: 1.2).
90. Singha AS, Priya B, Pathania D. Corn starch/poly (vinyl alcohol) biocomposite blend films: mechanical properties, thermal behaviour, fire retardancy and antibacterial activity. *Int. J. Polym. Anal. Character.* 2015, **20**: 357-366, (IF: 1.2)
91. Vyas V, Raizada P, Sharma U. Design and synthesis of anthraquinone derived ionophores and their extraction and transport ability for Li⁺, K⁺, Ca²⁺ and Mg²⁺ metal ions. *Proce. Nat. Acad. Sci. Ind. Sec.* 2010, **80**; 139-143. (IF: 0.2)
92. Vyas V, Raizada P and Sharma U. Characterization of anthraquinone derived redox switchable ionophores and their complexes with Li⁺, Na⁺, K⁺, Ca²⁺ And Mg²⁺ metal ions. *Int. J. Electrochem.* 2011:1-6. (IF: 2)

Chapters in Books:

1. Chauhan K, Sharma P. Chauhan GS. Removal/Dissolution of Mineral Scale Deposits, 2015 pp 243-264 (Elsevier).
2. Pathania D., Singh P, Nano sized metal oxide based absorbent for heavy metal removal: A review, Advanced material for agriculture, Food and Environment Safety, 2014 pp 243-264 Scrivener Publication (Wiley).

23. Details of patents and income generated:

The following is the list of patents filed by the School of Chemistry:

- Dr. Deepak Pathania and Rishu Katwal: Nanocomposite for removal of dye based water pollutants, Patent filing number: 1537/DEL/2015.
- Deepak Pathania and Divya Gupta, chitosan-g-poly (acrylamide)/copper nanocomposite for controlled drug delivery, Filing number TEMP/E-1/18765/2015-DEL.

- Deepak Pathania, Rishu Katwal, Gaurav Sharma, Nanocomposite for antimicrobial treatment of drinking water, Filing No. TEMP/E-1/18937/2015-DEL.
- Dr. Pradeep Singh, Pankaj Raizada & Pooja Shandilya: Novel nano graphine based composite for water treatment application and method of synthesis thereof, Filing No. 1819/DEL/2015.

Presently no income is generated from patents.

24. Areas of consultancy and income generated:

Faculty members of the School have been invited in national and international forum to deliver special talks to motivate and share their expertise with meritorious audience. The detail is presented below:

Table CH11: Consultancy as expert speaker

S. No	Faculty Name	Title/Area	Year	Funding Agency
1.	Dr. Neeraj Gupta	Unites States, India Educational Foundation, Invited speaker and resource person	2013	United States-India Educational Foundation, New Delhi
2.	Dr. Kalpana Chauhan	Stereochemistry, Invited speaker and resource person, INSPIRE	2013	DST, New Delhi
3.	Dr. Deepak Pathania	Chromatography Techniques, resource person	2015	SERT, Solan H.P.

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

Faculty members of the School have been selected to participate in specialized training programs to meet the growing need of today's technological world. Following is the list of such programs attended by the faculty:

- Dr. Kalpana Chauhan selected for BRNS-AEACI Winter School on Analytical Chemistry (SAC-5) IIT Roorkee, Roorkee, 3-10 December, 2012.
- Dr. Kalpana Chauhan selected in Summer Research fellowships-2014 from Science Academies.
- Dr. Deepak Pathania attended training program on Advance Materials and Characterization techniques sponsored by TEQIP at NIT, Jalandhar, Punjab from 1-7 June, 2015.
- Dr. Deepak Pathania attended training program on Advances in Chemical Sciences organized by Aligarh Mushlim University, Aligarh from 5-7 March 2011.

26. Faculty serving in

- a) **National committees:** Nil
- b) **International committees:** Nil
- c) **Editorial Boards:**

Table CH12: List of faculty member acting as member of editorial board in international journal.

S. No.	Faculty Name	Journal Name
1.	Dr. Amit Kumar	International Association of Scientific Innovation and Research, Georgia , United States
2.	Dr. Deepak Pathania	International Journal of Theoretical and Applied Sciences, India
3.	Dr. Gaurav Sharma	Universal Journal of Chemistry, Horizon Research Publishing, USA

d) Any other:

Faculty members are serving as reviewer in the following journals.

Table CH13: List of faculty serving as reviewer in reputed journals

S. No	Faculty Name	Publication House: Journal
1.	Dr. Deepak Pathania	Elsevier; Journal of Molecule Liquid, Journal of Alloys and Compounds, International Journal of Biological Macromolecules, Journal of Material Science and Engineering, Chemical Engineering Journal, Taylor and Francis: Desalination and Water Treatment
2.	Dr. Amit Kumar	Elsevier; Journal of Alloys and Compounds, Applied Catalysis, Clean Air, Desalination Willey; Water and Soil Royal Society of Chemistry: RSC Advances Taylor and Francis; Desalination and Water Treatment, Springer: Fibers and Polymers
3.	Dr. Gaurav Sharma	Hindawi Publishing Corporation; Journal of Chemistry, Elsevier; .Journal of Alloys and Compounds, Hydrometallurgy, Taylor and Francis; Desalination and Water Treatment
4.	Dr. Kalpana Chauhan	Elsevier; Carbohydrate Polymer, Journal of Biological Macromolecules, Desalination, Journal of Hazardous materials, European Journal of Medicinal Chemistry John Wiley & Sons, Inc.: Journal of Applied Polymer Science Taylor and Francis; Desalination and Water Treatment
5.	Dr. Pardeep Singh	Elsevier; Journal of Hazardous Materials, Desalination, Chemical Engineering Journal

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

The School of Chemistry endeavors to attain academic excellence by further diversifying the teaching and research skills of the faculty. The university has been organizing various faculty development programs to recharge and boost the teachers. Eminent academicians, researchers and industry experts are invited as resource persons in such programs. Some of these have been listed as under:

Table CH14: List of faculty recharging programs

S. No	Topic	Year	Resource Person
1.	Thesis & Paper Writing	2015	Dr. Klaus von Gadow, University of Germany, Germany
2.	“Innovation, Innovative Minds Impacting Change”	2015	Dr. P.S. Ahuja, former Director General, CSIR-IHBT Palampur
3.	“Latest Trends and Scientific Innovations”	2015	Dr. Niranjana Bilgi, Scientist, Entrepreneur & Consultant
4.	eUniv Workshops	2014	Mr. Kamal Kant, Assistant Professor, MBA, Shoolini University, Solan
5.	eUniv Workshops	2013	Mr. Kamal Kant, Assistant Professor, MBA, Shoolini University, Solan
6.	Research Writing	2013	Ms. Andrea Wright, Brown University, USA
7.	Workshop on Advances in Electron Microscopy and Allied Fields	2011	Mr. M.L Sharma, SAIF, PU Chandigarh

In addition to the above faculty development programs, faculty members attended national and international conferences; and different Academic Staff Development Programs outside the University. Some of these have been listed below:

Table CH15: List of individual participation in faculty recharging programs

S. No.	Academic Staff Development Programs Summer / winter Schools, workshops etc.	Name of Faculty Member
1.	One week TEQIP sponsored short term course on Advance Materials and Characterization techniques at NIT, Jalandhar, Punjab, 1-7 June, 2015.	Dr. Deepak Pathania
2.	Summer Research Fellowship from Science Academies' at Institute of Chemical Technology, Mumbai, 2014	Dr. Kalpana Chauhan
3.	Fifth BRNS-AEACI Winter School on Analytical Chemistry-2012 at IIT Roorkee, Roorkee, 3-10 December, 2012	Dr. Kalpana Chauhan

28. Student projects:

Projects are a mandatory part of the course curriculum for each UG and PG program offered by the School. These projects expose the students to analytical thinking for innovative solution of today's big concern and enhance their expertise in theoretical and practical aspect of instrument operating skills.

- percentage of students who have done in-house projects including inter- departmental projects: **90%**
- percentage of students doing projects in collaboration with other universities/industry /institute: **10%**

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

Doctoral / post doctoral fellows:

- Dr. Neeraj Gupta received CAS fellowship-2014 from Chinese Academy of Sciences, China.
- Dr. Neeraj Gupta received Prestigious Fulbright Nehru Postdoctoral Research Fellowship (2011-12): Awarded by United State India Educational Foundation (USIEF).
- Dr. Kalpana Chauhan received Summer Research Fellowship-2014 from Science Academies at ICT Mumbai.

Faculty:**Table CH16: List of awards and recognitions received by faculty**

S. No.	Faculty Name	Awards / recognitions	Events/Conference
1.	Dr. Deepak Pathania	Best paper	National Workshop Cum Seminar on Advances in Electron Microscopy & Allied Fields organized by Shoolini University, Solan, 21-28 September, 2011
2.	Dr. Kalpana Chauhan	Best Oral Presentation	International Conference “Chemical Constellation Cheminar-2012 on Chemistry for Sustainable Development and Innovations, at Dr. B R Ambedkar National Institute of Technology, Jalandhar (Punjab) India, 10-12 September, 2012
		Best Presentation	International Symposium on Recent Advances in “Green Chemistry” and “Chromatography Sciences” at Manav Rachna International University, Faridabad, India; January 12-14, 2012
3.	Dr. Pardeep Singh	Best reviewer	Awarded by Elsevier Desalination, 2012
4.	Dr. Amit Kumar	Travel Award from DST	Awarded to attend 2nd International Conference on Structural Nano Composites (NANOSTRUC 2014), Madrid Spain, 20-21 May, 2014

Students:**Table CH17: List of recognitions/ awards received by students**

S. No.	Student	Year	Recognition/Award
1.	Anamika	2012-2013	INSPIRE Fellowship
2.	Preeti Oswal		INSPIRE Fellowship
3.	Madhur Sharma	2013-2014	INSPIRE Fellowship
4.	Sumit		INSPIRE Fellowship
5.	Amit Kumar		INSPIRE Fellowship
6.	Ashish Soni		INSPIRE Fellowship
7.	Kritika Sood		INSPIRE Fellowship
8.	Rishav Sharma	2014-2015	INSPIRE Fellowship
9.	Ajay Kumar		INSPIRE Fellowship
10.	Deepali		INSPIRE Fellowship
11.	Vaishali		INSPIRE Fellowship

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

National Conferences: 03

Table CH18: List of seminars/ conferences/workshops organized by School of Chemistry

Name	Title / Theme	Funding Source	Date
National Workshop Cum Seminar*	Advances in Electron Microscopy & Allied Fields	DRDO, ISRO, Electronic Society, India	September 21-28 , 2011
Seminar	Advances in Environmental Sciences, SAES-2012	Satluj Jal Vidyut Nigam Ltd. Shimla	August 24, 2012
National Conference	Science: Emerging Scenario and Future Challenges	DRDO, ISRO, Satluj Jal Vidyut Nigam Ltd. Shimla	March 8-11, 2013

*The conference was jointly organized with School of Physics and Materials Science.

31. Code of ethics for research followed by the departments:

Follows International code of ethics set by International Journals and books

32. Student profile program-wise:

Table CH19: Program-wise pass percentage of students in different academic years

Name of the Program (refer to question No. 4)	Year	Applications received	Selected		Pass %	
			Male	Female	Male	Female
B.Sc. (Hons) –M.Sc. Dual Degree	2012-15	9	0	03	-	-
	2013-16	18	05	01	-	-
	2014-17	21	05	03	-	-
M.Sc.	2010-12	72	20	47	95	100
	2011-13	32	13	32	100	100
	2012-14	35	13	19	92.3	100
	2013-15	18	06	11	-	-
	2014-16	57	26	27	-	-
M.Phil.	2009-10	4	02	02	100	100
	2010-11	19	01	15	100	100
	2011-12	17	01	15	100	100
	2012-13	8	01	07	100	100
	2013-14	15	-	14	100	100
	2014-15	4	-	04	-	-
Ph.D.	2010	5	01	04	100	75
	2011	11	02	09	50	11.11
	2012	7	02	03	-	-
	2013	5	02	02	-	-
	2014	5	03	02	-	-

33. Diversity of students

Table CH20: Program-wise data for diversity of students

Name of Program (refer to question no. 4)	Year	% of student from the same university	% of students from other universities within the state	% of student from universities outside the state	% of students from other countries
B. Sc. (Hons)- M.Sc. Dual Degree	2012-15	None	100%	None	None
	2013-16	None	100%	None	None
	2014-17	None	100%	None	None
M. Sc.	2010-12	None	97.05%	2.95%	None
	2011-13	None	95.55%	4.45%	None
	2012-14	None	87.87%	12.13%	None
	2013-15	None	94.12%	5.88%	None
	2014-16	None	98.12%	1.88 %	None
M. Phil.	2009-10	None	100%	None	None
	2010-11	None	26.66%	73.34%	None
	2011-12	None	50.00%	50.00%	None
	2012-13	50.00%	25.00%	25.00%	None
	2013-14	57.14%	28.57%	14.29%	None
	2014-15	75.00%	None	25.00%	None
Ph.D.	2010-11	40.00%	20.00%	40.00%	None
	2011-12	70.00%	20.00%	10.00%	None
	2012-13	60.00%	20.00%	20.00%	None
	2013-14	None	50.00%	50.00%	None
	2014-15	40.00%	20.00%	40.00%	None

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

Table CH21: List of successful students in different competitive examination

S. No.	Competitive examinations	Number of student
1.	NET	01
2.	PGT	01
3.	Banking	04

35. Student progression

Table CH22: Detail of student progression

Student Progression	Percentage against enrolled
UG to PG	NA
PG to M.Phil.	6.94%
PG to Ph.D.	6.48%
Ph.D. to Post-Doctoral	NA
Employed <ul style="list-style-type: none">• Campus selection• Other than campus recruitment	25% 62.22%
Entrepreneurs	Nil

36. Diversity of staff

The School of Chemistry has faculty with diverse background having done their degrees from reputed national and international Universities/Institutes.

Table CH23: Diversity of staff

Percentage of faculty who are graduates	
of the same University	11.11%
From other universities within the State	44.4%
From universities from other States	44.4%
From universities outside the country	-

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

- Dr. Gaurav Sharma, Ph.D. (2014)
- Dr. Amit Kumar, Ph.D. (2014)

38. Present details of departmental infrastructural facilities with regard to

Library:

Yogananda library of Shoolini University is fully digitized and houses text books, reference books, journals, magazines and newspapers both in hard bound and as e-resource sufficient for academic and research requirements of the students. All the e-resources are available to the faculty and students through Learning Management System (LMS) and Knowledge Management System (KMS). Yogananda library has subscription to a

number of learning packages from EBSCO which includes more than a lakh e-books and ~9000 research journals etc.

In addition to central library each school has its own virtual library which is linked to the central library with a minimum physical books and journals. All the study material available in the central library can be easily used through school libraries. School library also contains thesis, dissertations, project reports etc.

Following is the study material related to School of Chemistry details are as follows :

Central and School library facilities are provided.

- (i) Central Library. 9982 books, 35 Physical journals and e-journals 510 provided by DELNET and wide range of 9000 plus e-journals provided by EBSCO
 - (ii) School Library: Developed as a Wi-Fi Hotspot for ready access to subject specific e-Journals and KMS. Also contains essential reference books.
- a) **Internet facilities for staff and students** :Wi-Fi, LAN connections
 - b) **Total number of class rooms** : 04
 - c) **Class rooms with ICT facility** : 02 (movable)
 - d) **Students' laboratories** : 03 (Inorganic, Organic and Physical Chemistry)
 - e) **Research laboratories** : 02 (Synthesis and Analytical laboratory)
 - f) **Research facilities** :

Research laboratories

- **Synthetic Research Laboratory:**

It is equipped with general laboratory synthesis equipments i.e. rotary evaporator, thermostat, muffle furnace, microwave oven, mechanical stirrer and stirrer with RPM control to supplement the reproducible research outcome.

- **Analytical Research Laboratory:**

The laboratory is providing the critical analysis for primary information of materials by some sophisticated instruments i.e. CV, HPLC, UV-visible etc. These equipments provide crucial information to help and meet research quality goals.

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

a) from the host institution/university

Table CH24: List of doctoral students from Shoolini University

S. No.	Name	Topic
1.	Gaurav Sharma	Nanocomposite ion exchanger: synthesis, Characterization and applications.
2.	Jasvinder Kaur	Synthesis and characterization of biodegradable quaternary ammonium starch based anionic exchanger for water technology.
3.	Bhawana Kumari	Design, Synthesis and In-vitro Evaluation of Novel Potent Biologically Active Sulphur Compounds
4.	Kamini Thakur	Pretreatment of natural fiber with environment benevolent method for developing cryogenically process polymer composite for advanced structural applications
5.	Poonam Thakur	Electrochemical synthesis of some compound of Tin
6.	Rishu Katwal	Electrochemical synthesis of Nano-copper and nano-aluminum oxide nanoparticles
7.	Vishal Priya	Development of bio-based thiomers for arsenic removal from aqueous environment
8.	Reena Sharma	Synthesis of Characterization of Guar-Gum - PANI Based conducting Superabsorbent For High Performance Applications
9.	Kshama	Synthesis of Conducting Gum Ghatti-PANI Based Interpenetrating Networks & their applications as controlled drug delivery devices
10.	Sourav Gautam	Graphene & bentoite supported ferrites nano-composites for efficient antibiotic degradation
11.	Pushpa Bhardwaj	Studies Towards the synthesis of Indole, Imidazole and Pyrrole Derivatives Using Environmental Benign Methodologies
12.	Bhanu Priya	Visible Light Assisted photo degradation of antibiotics utilizing BiOCl based composites
13.	Ajay Kumar	Nano-composites application in water technology
14.	Arush Sharma	Study on preparation of activated carbon magnetic nan-composite for the environmental remediation

b) from other institutions/universities:

Table CH25: List of doctoral students from other institution/university

S. No.	Name	Topic
1.	Bhanu Priya	Modification of Lignocellulosic Fiber and Their Application in the Synthesis of Fiber Reinforced Polymer Matrix Based Composites
2.	Priyanka Sharma	Atmospheric Chemistry of Ozone, its Precursors, Particulate Pollutant in Relation to Indicators of Climate Change in the Kullu Valley, Northwestern India Himalaya.
3.	Shikha Sharma	Remediation of organic and inorganic pollutants from water system using low cost biosorbents.
4.	Rahul Sharma	Development of Cryogenically Processed Bio- & Nano Polymer Composites Reinforced with Natural Fibers.
5.	Dolly Rana	Polymer assisted synthesis of nanoparticles & nanocomposites and their biological applications.
6.	Deepika Jamwal	Synthesis structure and morphology of semiconductor-nanomaterials and their applications.
7.	Bhim Singh	Studies on Synthetic Organic-Inorganic hybrid ion exchangers & their analytical applications.
8.	Naresh Chandel	Hydroxyapatite and bentonite supported coupled semiconductors for synergetic azo dye degradation.
9.	Divya Gupta	Synthesis of Biopolymer based chitosan-g-poly(acrylamide)/metal/metal sulphide nanocomposite, its characterization and applications in different fields.
10.	Rajesh Kumar	Nano-composites in water applications
11.	Anu Sharma	Novel method for the quantitative analysis of inorganic elements in the organic compounds and their separation using composite material.
12.	Prem Singh	Arsenic detoxification by chitosan thiomers
13.	Manita Thakur	Study on kinetics and ion exchange properties of bio- nano composite ion exchanger.
14.	Pooja Shandilya	Graphene based composite for water purification
15.	Swadeep Sood	Synthesis of Nanohydrogel for diverse application

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

Several PG and research students receive financial assistance from the university. Following is the list of students who have received financial assistance from the university:

Table CH26: List of students getting financial assistance from university

S. No.	Name	Year	Program
1.	Pooja Thakur	2010-2011	M.Sc.
2.	Sumit Sharma		
3.	Harjyoti Sharma	2011-2012	M.Sc.
4.	Diksha Sharma		
5.	Shivani		
6.	Neelam Gupta		
7.	Renu Chauhan		
8.	Smriti Thakur		
9.	Nitish Uppal		
10.	Pariksht Sambyal	2012-2013	M.Sc.
11.	Ajay Kumar		
12.	Maneesh Kumar		
13.	Jyoti Ktoch		
14.	Smriti Thakur		
15.	Pooja Sharma		
16.	Lalita Chandel	2013-2014	M.Sc.
17.	Priya		
18.	Mansi Sood		
19.	Karishma Bharti	2014-2015	M.Sc.
20.	Neha		
21.	Pooja Thakur		
22.	Shelja Rana		
23.	Manju Bala		
24.	Shivani	2013-2014	M.Phil.
25.	Manjeeta		
26.	Himanshi Kapoor		
27.	Smriti Thakur		
28.	Priyanka Kumari		
29.	Rasna Chadha		
30.	Mamta Kumari		
31.	Sarvjeet Kaur		
32.	Jaswinder Kaur	2010-2011	Ph.D.
33.	Bheem Singh Rathore	2011-2012	
34.	Kashma		
35.	Dolly Rana		

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

Yes, the need for new programs and courses is assessed from the time to time. On basis of inputs from the stake holders including the potential employers, academicians, faculty of the School and alumni, Dean of the Faculty with Head of School proposes new programs. The proposal is put forward to Board of Studies, which then assess the need. Finally, the proposal is forwarded to Academic Council for consideration and approval.

42. Does the department obtain feedback from

a) faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

Yes, feedback is obtained from the faculty on curriculum as well as teaching –learning –evaluation on regular basis in the faculty meetings, Board of Studies, and other similar forums. Academic Committee has also been constituted as per the directions of Academic Council that includes specialized senior faculty members and experts from other Universities. The feedback is positively taken into consideration for improving the curriculum for increasing career options. Following initiatives have been taken in the School as per the recommendations of the committee:

- New analytical instrumental techniques are introduced to increase career option in industry
- Research projects are added as compulsory activity for increasing career option in research organization and industry
- Courses content also contain components from CSIR-UGC NET Curriculum
- Revision of curriculum and the feedback from faculty is taken into consideration for the major modification.
- The comments from faculty from each specialization are given due weightage while designing the curriculum and syllabus.
- Faculty feedback has a major role for the design of practical training with provision for making availability of modern/advance techniques and other required support.

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

Yes, feedback is obtained from the students on staff, curriculum and teaching- learning-evaluation by Dean Academic Affairs. The feedback is shared with the faculty and staff to help them to improve the teaching skills. The feedback is also taken into consideration for improving the curriculum and teaching-learning-evaluation.

c) alumni and employers on the programs offered and how does the department utilize the feedback?

Yes, feedback is obtained from alumni and employers on the programs and curriculum discusses during their visits to the campus. The feedback is utilized in designing and revision of the curriculum based on the experience of alumni in their work places.

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

Some of the most successful alumni who have been working with eminent organizations and achieving new heights in their respective fields of work is listed below.

Table CH27: List of successful alumni

S. No	Student Name	Course Studied	Current Occupation	Company/ Employer
1	Jagdev Thakur	M.Sc.	Analyst	Analyst
2	Himesh	M.Sc.	Chemist	Johnson & Johnson, Baddi
3	Abhishik	M.Sc.	Chemist	Johnson & Johnson, Baddi
4	Vivek Glari	M.Sc.	Chemist	Lupin Pharma, Jammu
5	Sarabjeet Kaur	M.Phil.	Assistant Professor	IEC University, Baddi
6	Dr. Shikha Sharma	Ph.D.	Lecturer	Govt. Senior Secondary School, Rampur, HP
7	Rajeev Dogra	M. Phil	Lecture	Navodaya Vidyalaya
8	Shilpa	M.Sc.	Lecturer	Bhojia Dental College and Hospital, Nalagarh, District Solan
9	Munish Thakur	M. Phil.	Assistant Manager	HP Cooperative Bank
10	Ajay Tainta	M.Sc.	Probationary Officer	Punjab & Sind bank, Mandi
11	Dr. Bhim Singh Rathore	Ph.D.	Associate Professor	Govt. College, Nalagarh, Solan.

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

Frequent visits by eminent expert from industry and academia provide exposure to the students to know more about the latest developments in subject. Some of such program and eminent speakers have been listed as under:

Table CH28: List of student enrichment programs

S. No.	Topic	External experts
1.	Six day National workshop on “Advances in Electron Microscopy and Allied Fields (NWAEMA-2011)” 21-28 September, 2011	Mr. M.L. Sharma, PU Chandigarh
2.	Natural Chemistry, 2015	Prof. P.S. Kalsi, PAU, Ludhiana, Punjab
3.	SPRINT on communication skills and analytical skills, 2013, 2014 & 2015	Ms. Poonam Nanda, Coordinator SPRINT, Shoolini University
4.	Thesis & Paper Writing, 2015	Prof. Klaus von Gadow, University of Germany,
5.	Research Writing, 2013	Ms. Andrea Wright, Brown University, USA
6.	Bouncing back in Life, 2015	Mr. Vivek Atray, IAS officer and also a Novelist/Author
7.	Scope in Sciences	Mr. Sumit Gupta, MD Meridian Pharmaceuticals
8.	Agriculture Crisis in India, 2015	Mr. Davinder Sharma, a renowned Journalist
9.	Ecological Challenges in the Himalayan Region	Mr. Ajay Chaturvedi, Major General, AVSM, VSM (Retired)
10.	Proactive Leadership	Lt Gen. B S Jaswal, PVSM, AVSM, VSM retired
11.	Research Analytical Tools/Sampling Error, 2014	Prof. Kulvinder Singh, Department of Education, Punjabi University Patiala
12.	Scope in Sciences, 2014	Mr. Sumit Gupta, MD Meridian Pharmaceuticals
13.	Training on SPSS, 7 th -8 th June, 2013	Dr. Arunesh Garg, Gyan Jyoti Insititute of Management, Mohali
14.	Chemistry Our Life Our Future	Prof. N.C. Kothiyal, NIT, Jalandhar
15.	Materials Old and New	Prof. D.V.S. Jain, Department of Chemistry, Punjab University, Chandigarh

S. No.	Topic	External experts
16.	Introduction to Nanotechnology	Prof. S.K. Mehta, Department of Chemistry and Centre of Advanced study in Chemistry, Punjab university, Chandigarh
17.	Chemistry: The Central Science	Prof. G.S. Chauhan, Department of Chemistry, H.P. University, Shimla
18.	Chemistry Our Life Our Future	Prof. AS Singha, NIT Hamirpur
19.	Fascinating Aspects of Chemistry	Prof. K. K. Bhasin, Panjab University, Chandigarh
20.	Adulteration In Food	Dr. Harpreet Kaur, Punjabi University, Patiala

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

In addition to convention way of teaching, the School has been making the extensive use of modern teaching methodologies i.e. online lectures under eUniv initiative. The online lectures serve as supplement to classroom teaching where students get free access to the study material, power point presentations, audio-visuals, video lectures etc. The detailed list of teaching methods include:

- **Lecture method:** Teaching is done by using the chalk and talk and power point presentations
- **Interactive Teaching:** The Interactive method includes audio-visual aids, live demonstrations with group discussion.
- **Project based learning:** The minor and major projects related to research work are done by U.G. and P.G. students
- **Lab and industrial visits:** Training in industries and R&D institutions is a mandatory part of course curriculum in undergraduate programs
- **Experimental learning:** The theoretical teaching concepts are supported by experimental learning as practicals.
- **Other Activities:** The subject related seminars, extempore, quizzes and assignments are given to U.G. and P.G. students.

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

The progress in achieving the program objectives of excellent analytical skills and innovative thought process is periodically monitored by Board of Studies which includes external experts from the academia, faculty meetings, student interactions and interaction with other stake holders. The

learning outcomes are monitored by continuous evaluation program including:

- Internal examinations and assessment
- Quizzes
- Surprise tests
- Tutorials
- Assignments
- Seminars
- Viva-voce
- Project evaluation for analytical skills
- Course completion report at the end of the semester
- Detailed course coverage in final question papers.

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

The School of Chemistry is activity involved in extension activities at University level, School level and individual level. The illustrative list is presented below:

- Regular participation of students in science activities in Chemistry Club
- Live demonstrations of basic chemistry concept in DST-INSPIRE camps for motivating the students for basic sciences
- Frequent chemistry lectures by expert in senior secondary Schools of Himachal Pradesh for basic science promotion
- Promoting interdisciplinary research thought and collaboration by organizing conferences and seminar in different part of Himachal Pradesh through Him Science Congress Association
- Participation in “Swachh Bharat Abhiyan”
- Organized “National Drinking water and sanitation Awareness Day” on 19th March, 2015
- Participation in ‘Marathon’ on Teachers Day
- Participation in Nature admiration through Flower fest in every spring season
- Faculty in School of Chemistry participated and presented papers in national and international conferences

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

School is committed to achieve its goal of excellence and for that ensured the participation of students and faculty in beyond syllabus scholarly activities. Some are enumerated as:

- SPRINT program for skill development and professional training.
- Industrial and institutional visits for career expos.

- Participation in DST-INSPIRE Camp to promote basic science as career option.
- Workshop and conferences are regularly organized to keep the students well informed about the recent developments in the field of science.
- Expert lectures by resource persons to cultivate the values of honesty, hard work and achieving excellence in life.
- Chemistry club activities for day-to-day science awareness.
- NET coaching by subject experts.

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

Yes the program/ School is approved by UGC.

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

The School of Chemistry is focusing its research efforts in exploring the sustainable waste biomass for value addition and generating the alternate green chemicals of industrial importance. In this field of novelty, School has generated new knowledge that is reflected in the form of publications in high reputed journals. Some promising leads in nanoparticle synthesis and photo-catalysis have been identified for water purification applications with industrial relevance. Details of collaborations, published research papers and patents filed are provided at serial No. 18, 22 and 23.

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

Strengths:

Quality and diversity in research:

The School of Chemistry is committed to good quality fundamental research on diverse topics i.e. sustainable chemistry/green chemistry, water technology and innovative material synthesis, drug designing etc. The School has generated a good number of academic publications in reputed international journals. Some of these include: *J. Phy. Chem. C.*, *Ind. Eng. Chem. Res.*, *Appl. Catal. B: Environ.*, *Water Res.*, etc. The School also succeeded in getting research funding from DST and BRNS.

Experienced faculty:

The School has well qualified faculty with extensive experience in teaching and research. Eighty nine percent of faculty is with doctoral degrees and some are with international Post-Doctoral experience. Some of our teachers have been elected in national and international science forums and have received prestigious awards including the best reviewer

from Elsevier and young scientist awards from DST and Lucid Colloid Ltd., Mumbai etc.

Collaborations with national and international institutes:

The School is promoting interdisciplinary research and is actively involved in research collaborations with reputed national and international institutions. This includes project on nanotechnology and water sustainability with Jubail University College, Saudi Arabia and nanoparticles and nano-composites for bio-applications with Center for Advanced Biomaterials for Healthcare, Naples, Italy.

Innovative teaching techniques:

School explores innovation in teaching and uses modern teaching methodologies i.e. online lectures under eUniv initiative. We have specialized SPRINT program for students, where programs like persona enhancement, resume writing, interview facing, group discussion, presentation skills and expert talks by professionals from industry and academia help students enhance their soft and technical skills.

Weaknesses:

National and international fundings:

School has limited number of research grants and aspires to obtain more projects with technological outcomes for the overall improvements in research infrastructure. The faculty is working hard to get more external fundings. Some new projects have been submitted and are currently under review with various funding agencies.

High-tech Facilities:

The School of Chemistry has basic equipments and lab facilities, yet requires more advanced analytical instruments for structural characterization of synthesized green chemicals. School has taken the initiative and already submitted a DST-FIST project (Rs 2.85 crore) for high-tech facilities.

Industrial collaborations for technological outcome:

School has generated good knowledge through high impact publications and working hard to further strengthen the research by initiating collaborative and consultancy projects with industry for technological outcome.

Quality of students:

Himachal Pradesh has many institutions and it is not always possible to attract bright students as they have their own options. However, we are working hard to provide high quality education for better employability in

industry and research organizations. This is expected to communicate a positive message to bright and motivated aspirants to join us for better career opportunities.

Opportunities:

Interdisciplinary Research Programs:

School provide opportunities for research in cooperation with other Schools such as School of Biological and Environmental Sciences, School of Biotechnology and School of Pharmaceutical Sciences. The interdisciplinary research will equip the student for global competence by providing opportunity to work in the newly emerging interfaces in research. The School has national and international research collaborations/research projects or student training abroad also to achieve excellence in thrust areas.

Better Job Opportunities for Students:

School curriculum is in accordance with industrial requirements and provides ample opportunities for students for employment in industry and research organizations. The School also organize expert lectures from industries to update the analytical aspect of the students and inculcate the foundation needed for a meaningful professional career.

Training Program:

Currently, the School provides basic research training for UG and PG students from other national institutes. The School would further like to provide training on advance chemistry to these and other stakeholders.

Sustainable Chemistry Research, an area of upcoming thrust:

Faculty has identified the advantages of natural product research and is actively engaged in exploration of novel materials of industrial efficiency in water applications and catalytic applications to meet the need of growing population.

Challenges:

Attracting Good Quality Students and Faculty:

It is normally difficult to attract highly motivated and talented students and faculty at a private university as they often choose to work in government institutes. The general perception among the students is that private institutes do not conduct quality research. We are slowly but surely changing this perception by attracting high quality faculty, obtaining more research grants and generating high impact publications.

Improving Technical Skills of the Students:

The new challenge for the School is analytical improvisation of students to enhance their career opportunities in national and international research organizations. The outcome for which is able to establish the School nationally at recognizable place for industrial collaborations.

Interdisciplinary Funding:

School also aspires to formulate and get funding of multi-crores projects aimed at technological outcome and to invest back in overall improvement of the research infrastructure. For this international research project grants have also been targeted.

Development of International Standard Labs:

In order to further improve the quality of research and impart international standard practical training to the students, the challenge is that the infrastructure of the labs should also be enhanced to international level.

52. Future plans of the department:

In the years to come, the School of Chemistry will put earnest endeavors not only to maintain its high quality of teaching through individual student project and seminar presentation but also aim at improving performance in high quality research in different thrust areas to contribute in society's standards of living. To increase the visibility of School in National and International forums, the School faculty has upgraded the curriculum according to the need of industry and putting our hard efforts to foster the global competence among students. The detailed areas of future plan are highlighted below:

Skill Development Programs:

School of Chemistry recognizes the importance of skill development of the students. The School intend to provide students with infrastructure and training support to facilitate learning, apprenticeships, profession specific skill development, soft skills, e-learning, training for self-employment and entrepreneurial training. These steps would ensure that chemistry students become globally competent in the job market.

National and International Collaboration for Research and Academic Exchange:

The School has collaborations with reputed national and international institutes of excellence in education and research to improve its research capabilities. The School aims for extramural funding by international collaboration for research to establish itself at global scale.

Central research facility:

In order to further improve the quality of research and impart international standard practical training to the students, the infrastructure of the labs will be enhanced to international level. The School has started working to establish a high-tech lab facilities.

Extension activities:

There is lack of general science and scientific awareness. School of Chemistry aims to conduct more extension activities that are beneficial to the students, researchers and public at large.

Technological Applications:

In the coming days the School aims to design prototype technologies, protect intellectual rights by patent filing.

5. Evaluative Report of School of Physics and Materials Science

The School of Physics & Materials Science has contributed in a significant way to train the students in research and development by providing platform in basic research as well as novel interdisciplinary areas of Nanotechnology, Materials Science, Experimental High Energy Physics etc. The School has well-equipped computing facilities and laboratories. School has a rich pool of faculty members with postdoctoral experience from renowned foreign universities. Faculty members have attracted considerable support through research projects from DRDO, DAE, DST etc. One of the highlights of the School is its Student Exchange Program, which is run with Chung Yuan Christian University, Taiwan and Gachon University, South Korea. Another highlight is the Experimental High Energy Physics group of the School which is the part of European Organization for Nuclear Research (CERN) through India- CMS collaboration. CERN is the laboratory hosting world's biggest and highest energy experiment. The School has also organized summer training programs and two National conferences.

1. Name of the Department: School of Physics and Materials Science

2. Year of establishment: 2010

3. Is the Department part of a School/Faculty of the university?

Yes, School of Physics and Materials Science is a part of the Faculty of Basic Sciences.

4. Names of programs offered (UG, PG, M.Phil., Ph.D, Integrated Masters; Integrated Ph.D, D.Sc., D.Litt., etc.)

- B.Sc. (Hons) in Physics
- B.Sc. (Hons) -M.Sc. (Dual Degree Program)
- M.Sc. in Physics
- M.Phil. in Physics
- Ph.D. in Physics

5. Interdisciplinary programs and departments involved

The School of Physics and Materials Science has diversified its curriculum and sought expertise from other Schools in the university. Following is the list of other Schools involved in teaching:

Table PHYS-01: List of programs supported by other Schools.

S. No.	Program	Schools
1.	B.Sc. (Hons) Physics	School of Chemistry School of Biological & Environmental Sciences School of Business Management & Liberal Arts
2.	Ph.D. Physics	School of Business Management & Liberal Arts

6. Courses in collaboration with other universities, industries, foreign institutions, etc.

School of Physics and Materials Science has student exchange program with Gachon University, South Korea for UG and with Chung Yuan Christian University, Taiwan for P.G.

Table PHYS-02: Joint programs run by School of Physics with other Foreign Universities.

S. No.	Courses	Foreign University	Duration
1.	M.Sc. Physics	ChungYuan Christian University, Taiwan	One semester
2.	B.Sc. (Hons) Physics	Gachon University, South Korea	One Semester

7. Details of programs discontinued, if any, with reasons- None

8. Examination System:

The School has been following the semester and OCPA/OGPA grading system for all programs. Choice Based Credit System is being followed from 2015-16 as per the guidelines of UGC.

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

The School is actively exchanging faculty in programs run by other Schools. Since, the university is offering Choice Based Credit System, the School has decided to offer different electives which would generate the interest of students from other disciplines.

Table PHYS-03: Courses or electives taught by School of Physics for programs run by other Schools

S. No.	Courses	Programs	School
1.	Nano Biotechnology	M.Tech. Biotechnology	School of Biotechnology
2.	World of Physics, Electricity and Magnetism, Quantum Mechanics	B.Sc.(Hons) Chemistry, B.Sc.(Hons) Botany, B.Sc. (Hons) Zoology	a. School of Chemistry b. School of Biological & Environmental Sciences
3.	Physics	B.Tech. Engineering; Biotechnology; Bioinformatics; Food Technology	Faculty of Engineering & Technology

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

Table PHYS-04: Posts sanctioned and filled as per PCI/AICTE norms

Teaching Post	Sanctioned	Filled/Actual
Professor	02	01
Associate Professors	04	03
Asst. Professors	06	05

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

The School requires only five teachers for UG and PG programs and has higher number of teachers than required as per UGC norms. School teachers also teach in the Faculty of Engineering and Technology and those teachers not counted for teacher taught ratio.

Table PHYS-05: List of current faculty for School of Physics and Materials Science

Name	Qualifications	Designation	Specialization	No. of Years of Experience	Ph.D./ M.Phil. Students guided	Ph.D./ M.Phil. Students guiding
Dr. Atul Thakur	Ph.D., Post Doc	Professor	Materials Science	15	2 M.Phil.	6 (Ph.D.)
Dr. Preeti Thakur	Ph.D., Post Doc	Associate Professor	Materials Science	12	1 M.Phil.	4 (Ph.D.)
Dr. Radhe-shyam Rai	Ph.D., Post Doc	Assistant Professor	Condensed Matter Physics	11	-	4 (Ph.D.)
Dr. Suneel Dutt	Ph.D., Post Doc	Assistant Professor	Experimental High Energy Physics	2	-	3 (Ph.D.)
Parul Sharma	M.Phil.	Assistant Professor	Condensed Matter Physics	04	-	-
Kush Rana	M.Sc.	Assistant Professor	Condensed Matter Physics	02	-	-
Dr. Atul Pandey	Ph.D.	Associate Professor	Solid State Physics	11	-	-
Dr. Rajesh Kumar	Ph.D.	Associate Professor	Solar Energy	12	-	-
Mr. Virender Pratap Singh	M.Tech. M.Phil.	Assistant Professor	Condensed Matter Physics	7	-	-

12. List of senior Visiting Fellows, adjunct faculty, emeritus professors**Table PHYS-06: List of Visiting Faculty and Adjunct Faculty**

S. No.	Category	Name	Organization
1.	Adjunct Professor	Prof. Suman Bala Beri	Panjab University, Chandigarh
2.	Professor of Eminence	Prof. J. D. Sharma	Bells Institute of Management and Technology, Shimla

13. Percentage of classes taken by temporary faculty – programme-wise information: Nil**14. Program wise Student Teacher Ratio:**

- UG - 12:1
- PG - 8:1

15. Number of academic support staff (technical) and administrative staff:**Table PHYS-07: List of Academic support and administrative staff**

Staff	Sanctioned	Filled/Actual
Technical	02	01
Lab Attendants	04	02

16. Research thrust areas as recognized by major funding agencies

The School in alliance with the university research philosophy is focusing its research efforts on materials science and experimental high energy physics. The major thrust areas of the School are exploration of fundamental building of universe, understanding of the Parton Distribution Functions, Energy harvesting and different type of sensors. To promote the global competencies of the students the international research and ethical standards are followed by the School. Following four research thrust areas have been identified by the funding agencies:

- Physics beyond Standard Model using lepton and quark.
- Fabrication and characterization of nano magneto-dielectric materials for patch antenna.
- Nano magneto-dielectric materials for high frequency applications.
- Synthesis and characterization of nano-ferrites for the development of radar absorbing materials.
- Energy harvesting using piezoelectric materials.
- Solar energy, solar passive buildings and zero energy buildings.

17. Number of faculty with ongoing projects from

a) National: 04

The School of Physics & Materials Science has at present four ongoing projects funded from national agencies. In addition to this, one project has been successfully completed.

Table PHYS-08: List of ongoing projects

S. No.	Title of the Project	PI and Co PI's	Funding Agency	Amount (Rs.)
1.	Nano magneto-dielectric materials for high frequency applications	Dr. Atul Thakur	DAE	19 Lacs
2.	Synthesis and characterization of nano-ferrites for the development of radar absorbing materials	Dr. Preeti Thakur	DST	22.72 Lacs
3.	Search for Physics Beyond Standard Model using DZERO and CMS. Energies.	Dr. SuneelDutt	DST	16.50 Lacs
4	Development of Lead free piezoelectric nanofibers via Electrospinning for piezoelectric energy harvesting	Dr. Radheshyam Rai (PI) and Prof. N.K. Singh (Co.PI)	DRDO	26.89 Lacs

Project completed:

Table PHYS-09: List of completed projects

S.No.	Title of the Project	PI and Co PI's	Funding Agency	Amount (Rs.)
1.	Fabrication and characterization of substrate for patch antenna by using nano magneto-dielectric materials for the missile applications	Dr. Atul Thakur (PI) Dr. Preeti Thakur (Co. PI)	DRDO	10 Lakhs

b) International funding agencies: Nil

c) Total grants received: 85.11 Lakhs

18. Inter-institutional collaborative projects and associated grants received

a) National collaborations:

School has collaborations with national and international research institutes to encourage high-level research of global competence. Following is the list of collaborative projects initiated with different institutes:

Table PHYS-10: List of inter-institutional national collaborations

S. No.	Name of PI	Project Name	Collaborator
1.	Dr. Radheshyam Rai	Hydrothermal Growth of Multicomponent Barium Titanate based Ferroelectric Oxides for multilayer Capacitors	Dr. Seema Sharma, A.N. College, Magadh University, Patna
2.	Dr. Suneel Dutt	Search for Physics beyond Standard Model using tripleton final states	Prof. Satyaki Bhattacharya, Saha Institute of Nuclear Physics, Kolkatta
3.	Dr. Suneel Dutt	Search for India Search for Physics beyond Standard Model NMSSM GUTs at 13 TeV	Prof. Suman Bala Beri, Panjab University Chandigarh

b) International collaboration**Table PHYS-11: list of inter-institutional national collaborations**

S. No.	Name of PI	Project Name	Collaborator
1.	Dr. Atul Thakur	Characterization of Nanomaterials	Prof. J.H. Hsu, National Taiwan University, Taiwan
2.	Dr. Radheshyam Rai	Hydrothermal Growth of Multicomponent Barium Titanate based Ferroelectric Oxides for multilayer Capacitors	Dr. S. J. Milne, Leeds University, UK
3.	Dr. Radheshyam Rai	Characterization of Piezoelectric materials	Andrei L.Kholkin, CICECO, University of Aveiro, Portugal
4.	Dr. Radheshyam Rai	Magnetic study of materials	M. A. Valente Campus Universitario de Santiago, Portugal
5.	Dr. Radheshyam Rai	Biosensors and Bioelectronics study	Ashotosh Tiwari IFM, Linkopings Universitet, Linkoping
6.	Dr. Suneel Dutt	Search for contact interactions using inclusive Jet Pt Spectrum at 13 TeV	Prof. Harrison B. Prosper, Florida State University, USA
7.	Dr. Suneel Dutt	Test Beam Studies at Hadron Calorimeters	Prof. Sunanada Banarjee, Fermi National Accelerator Laboratory, USA

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

School of Physics & Materials Science has applied for the three crore DST-FIST funding.

20. Research facility / center State:

Shoolini University has established a Research Centre in Nanotechnology.

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

22. Publications:

Publication detail of School of Physics & Material Sciences is given herewith:

Number of papers published in peer reviewed journals (national / international): 32

- **Chapters in Books:** NIL
- **Books Edited :** 02
- **Books with ISBN with details of publishers:**
 - Radheshyam Rai, “Synthesis, Characterization and Application of Smart Materials” Nova Sciences Publishers, USA, 2012.
ISBN: 978-1-61470-642-7
 - Rajeev Aggarwal, Rajesh Kumar, “Techniques for Estimation of Solar Radiation: Past and Future” Lap Lambert Academic Publishing, Germany, 2010.
ISBN-13: 9783843373357
- **Number in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.):**
In Scopus: 32
- **h- index:** 2
- **Citation Index** –Average = 2.77
- **Impact Factor Range:** 0.47-7.728 (Average 2.80)

List of Publications:

1. Rana K, Thakur P, Sharma P, Tomar M, Gupta V, Thakur A. Improved Structural and Magnetic properties of Cobalt nanoferrites: Influence of Sintering Temperature. *Ceramics Int.* 2015, **41**: 4492-4497 (IF:2.086)
2. Thakur S S, Pathania A, Thakur P, Thakur A, Hsu JH. Improved structural, electrical and magnetic properties of Mn-Zn-Cd nanoferrites. *Ceramics*

- Int.* 2015, **41**: 5072-5078 (IF:2.086).
3. Thakur A, Thakur P and Hsu JH. Structural, Magnetic and Electromagnetic Characterization of In^{3+} Substituted Mn-Zn Nanoferrites. *Z. Phys. Chem.* 2014, **228** 663–672 (IF:1.178).
 4. Thakur A, Thakur P and Hsu JH. Magnetic behaviour of $\text{Ni}_{0.4}\text{Zn}_{0.6}\text{Co}_{0.1}\text{Fe}_{1.9}\text{O}_4$ spinel nano-ferrite. *J. Appl. Phys.* 2012, **111**, 305 (IF:2.185).
 5. Thakur S, Rai R, Sharma S. Structural characterization and magnetic study of $\text{NiFe}_{2\pm x}\text{O}_4$ synthesized by Co-precipitation method. *Mater. Lett.* 2015, **139**, 368-372 (IF:2.269).
 6. Rai R, Kumari P, Kholkin AL. Influence of BiFeTaO_3 addition on the electrical properties of $\text{Na}_{0.4725}\text{K}_{0.4725}\text{Li}_{0.055}\text{NbO}_3$ ceramics system using impedance spectroscopy. *J. Alloys Comp.* (Accepted) (IF:2.726).
 7. Sharma S, Shamim K, Kumari P, Kumar A, Rai R, Sinha S. Impedance and modulus spectroscopy characterization of Lead free Barium Titanate ferroelectric ceramics. *Ceramics Int.* (Accepted) (IF:2.086).
 8. Thakur S, Rai R, Tiwari A. Structural, dielectric and magnetic properties of Gd and Dy doped $(\text{Bi}_{0.95}\text{RE}_{0.05})(\text{Fe}_{0.95}\text{Mn}_{0.05})\text{O}_3$ ceramics synthesized by SSR method. *Solid State Comm.* 2014, **197**, 1-5 (IF:1.698).
 9. Kumar R, Aggarwal RK, Sharma JD, Pathania S. New Artificial Neural Network Model for Precise Estimation of Global Solar Radiations for Indian Locations. *Int. J. Green Energy* (Accepted) (IF:1.469), 2012 IF=0.5
 10. Rajesh Kumar, R K Aggarwal and J D Sharma, “Solar radiation estimation using artificial neural network: A review”, *Asian Journal of Contemporary Sciences*, 1, 12-17, 2012. IF=0.5
 11. Rajesh Kumar, R.K. Aggarwal, J.D. Sharma and Sunil Pathania, “Predicting energy requirement for cooling the building using artificial neural network”, *J. Technol. Innov. Renew. Energy*, 1 (2), 113-121, 2012. IF=0.5
 12. Rajesh Kumar, RK Aggarwal, Dhirender Gupta and Jyoti Dhar Sharma, “ ^{ss}C Carbon emissions from air- conditioning”, *American Journal of Engineering Research*, 2 (4), 72-74, 2013. IF=0.5
 13. Rajesh Kumar, R K Aggarwal and J D Sharma, “Predicting energy requirement for heating the building using artificial neural network”, *International Journal of Development Research*, 3 (5), 14-19, 2013. IF=0.47
 14. Rajesh Kumar, RK Aggarwal, Dhirender Gupta and Jyoti Dhar Sharma, “Predicting Total Solar Heat Gain of the Building Using Artificial Neural Network”, *International Journal of Modern Engineering Research*, 3 (3), 1606-1609, 2013. IF=1.227
 15. Rajesh Kumar, RK Aggarwal, Dhirender Gupta and Jyoti Dhar Sharma, “Predicting total ventilation losses of the building using artificial neural network”, *International Journal of Engineering Research-Online*, 1 (1), 61-68, 2013. IF=3.601

16. Kumar Rajesh, Aggarwal R K and Sharma J D, "Energy analysis of a building using artificial neural network: A review", **Energy and Buildings**, 65, 352-358, 2013. IF=2.88
17. Rajesh Kumar, RK Aggarwal and J D Sharma, "New regression model to estimate global solar radiation using artificial neural network", **Advances in Energy Engineering (AEE)**, 1 (3), 66-73, 2013. IF=0.5
18. Rajesh Kumar, RK Aggarwal, Dhirender Gupta and Jyoti Dhar Sharma "Predicting total conduction losses of the building using artificial neural network", **Energy and Environmental Engineering**, 1 (1), 1-4, 2013. IF=0.5
19. Rajesh Kumar, RK Aggarwal and J D Sharma, "Predicting total energy load of building using artificial neural network", **Energy and Environmental Engineering**, 1 (2), 25-35, 2013 IF=0.5
20. Rajesh Kumar, R.K. Aggarwal, J.D. Sharma and Sunil Pathania, "Artificial neural network model for precise estimation of global solar radiations", **Accepted by Solar Energy vide ref no SE-D-15-00912**. IF=3.469
21. Rajesh Kumar, R.K. Aggarwal, and J.D. Sharma, "Comparison of regression and artificial neural network models for the estimation of global solar radiations-An overview", **Accepted by Renewable & Sustainable Energy Reviews vide ref no RSER-D-15-01244**. IF=5.901
22. Kumar Rajesh, Aggarwal RK, Sharma JD, "Credentials of energy efficient technologies and solar passive features to trim down CO₂ emanation of an edifice", **Accepted by Energy and Buildings vide ref no ENB-D-15-01072**. IF=0.5
23. Rajesh Kumar, R.K. Aggarwal, and J.D. Sharma, "Performance evaluation of newly developed regression model to estimate global solar radiation", **Accepted by Solar Energy vide ref no SE-D-15-00914**. IF=3.469
24. T. Aaltonen, V.M. Abozov, B. Abbott, et al. Constraints on models for the Higgs boson with exotic spin and parity in $VH \rightarrow vbb$ - final states. *Phys. Lett. B*. 2014, 161802, 113 (IF:7.728). IF=0.5
25. V.M. Abozov, B. Abbott, B.S. Acharya, et al. Measurement of the differential inclusive $\Upsilon + 2$ b-jets cross section and the ratio $\sigma(\Upsilon + 2b)/\sigma(\Upsilon + b)$ in pp- collisions at $\sqrt{s} = 1.96$ TeV. *Phys. Lett. B* 2014, 357, 737 (IF:6.019).
26. V.M. Abozov, B. Abbott, B.S. Acharya, et al. Jet energy scale determination in the D0 experiment. *Nucl. Instrum. Methods A*. 2014, 442,763(IF:1.316).
27. V.M. Abazov, B. Abbott, B.S. Acharya, et al. Improved b quark jet identification at the D0 experiment. *Nucl. Instrum. Methods A*. 2014, 290,763(IF:1.316).
28. T. Aaltonen, V.M. Abazob, B. Abbott, et al. Higgs Boson Studies at the Tevatron. *Phys. Rev. D*. 2013, 052014, 88 (IF:4.864).
29. V.M. Abazob, B. Abbott, B.S. Acharya, et al. Combined Research for the Higgs Boson with the D0 experiment. *Phys. Rev. Lett.* 2013, 052011, 88 (IF:7.728).

30. V.M. Abazob, B. Abbott, B.S. Acharya, et al. Search for $ZH \rightarrow \ell\ell b\bar{b}$ production in 9.7 fb⁻¹ of pp- collisions with the D0 detector. *Phys. Rev. Lett.* 2013, 052010, 88 (IF:7.728).
31. V.M. Abazob, B. Abbott, B.S. Acharya, et al. Measurement of the ZZ production cross section and search for the standard model Higgs Boson in the four lepton final state in pp- collisions. *Phys. Rev. Lett.* 2013, 032008, 88 (IF:7.728).
32. V.M. Abazob, B. Abbott, B.S. Acharya, et al. Measurement of the $\Upsilon + c$ -jet cross section and the ratio $\Upsilon + c$ and $\Upsilon + b$ cross sections in pp- collisions at $\sqrt{s} = 1.96$ TeV. *Phys. Lett. B.* 2013, 354, 719 (IF:6.019).

List of scientific/ technical Books written by Faculty Members:

1. Synthesis, Characterization and Application of Smart Materials
Edited by Radheshyam Rai Nova Publishers, USA, 2011, ISBN: 978-1-61470-642-7.
2. “Techniques for Estimation of Solar Radiation-Past and Future” Printed and Published in Dec, 2010 by: Lambert Academic Publishing, Germany/USA/UK.

List of Chapters in Books written by Faculty Members: Nil

23. Details of patents and income generated: Nil

24. Areas of consultancy and income generated:

Faculty members of the School are actively involved in providing consultancy to the industry. The detail is provided below:

Dr. Atul Thakur and Dr. Neeraj Mahindroo worked on a project with Tirupati Medicare Ltd., Paonta Sahib, H.P. for size reduction of vitamin D₃ to nano scale (Rs. 30,000).

25. Faculty selected nationally / internationally to visit other laboratories / institutions / industries in India and abroad

Faculty members of the School have been continuously invited by national and international laboratories to participate in collaborative research activities.

The table below provides the details of the research visits of the faculty

Table PHYS-12: List of faculty members selected to visit national and International Laboratory/Institution:

S. No.	Faculty Name	National (Laboratory/Institution/ Industry)	International (Laboratory/Institution/ Industry)
1.	Dr. Atul Thakur	Terminal Ballistic Research Laboratory, Chandigarh Centre for Materials for Electronics Technology (C-MET), Thrissur, Kerala Raja Ramanna Centre for Advanced Technology, RRCAT, Indore Defense Lab, Jodhpur IIT, Mandi IIT, Delhi Delhi University Guru Jambheshwar University, Hisar	National Taiwan University, Taiwan Chung Yuan Christian University, Taiwan
2.	Dr. Preeti Thakur	Terminal Ballistic Research Laboratory, Chandigarh	-
3.	Dr. Radheshyam Rai	Delhi University SSPL New Delhi Magadh University, Bodh Gaya. IIT Delhi, NPL Delhi	Leeds University, UK
4.	Dr. Suneel Dutt	Saha Institute of Nuclear Physics, Kolkata Tata Institute of Fundamental Research, Mumbai Panjab University, Chandigarh	Fermi lab, USA

26. Faculty serving in

a) National committees –Nil

b) International committees

Dr. Radheshyam Rai is a member in Executive Committee of International Union of Advanced Materials (IUAM), China.

c) Editorial Boards

Dr. Radheshyam Rai is an Associate Editor of International Journal "Chemistry Lab".

d) Any other

1. Dr. Atul Thakur is a Life member of
 - Innovative Science Research Society (ISRS)
 - High Energy Materials Society of India (HEMSI)
2. Dr. Preeti Thakur is a Life member of
 - High Energy Materials Society of India (HEMSI)
 - Innovative Science Research Society (ISRS)
3. Dr. Atul Pandey is Life member of
 - The Indian Society for Technical Education (ISTE),
 - Indian Physics Association (IPA)
 - Him Science Congress Association (HSCA)
4. Dr. Radheshyam Rai is a Life member of
 - Him Science Congress Association (HSCA)
 - Indian Physical Society of India
 - Aryabhat Research Journal of Physical Sciences
5. Dr. Suneel Dutt is a Life member of
 - Him Science Congress Association (HSCA)

Reviewer of Journals:

Faculty members are serving as reviewers in many research journals. Details are given in table below:

Table PHYS-13: List of faculty members serving as experts in committees, resource persons, journal reviewers

S. No.	Faculty Name	Journal
1.	Dr. Atul Thakur	Journal of Magnetism and Magnetic Materials, Journal of Non-Crystalline Solids, Journal of Physics D: Appl. Physics, Journal of Alloys and Compounds, Journal of Physics: Condensed Matter, Nanotechnology, Physica Scripta

S. No.	Faculty Name	Journal
2.	Dr. Preeti Thakur	Journal of Physics & Chemistry of Solids, Solid State Sciences, Materials Chemistry and Physics, Journal of Physics D: Applied Physics, Crystal Growth & Design, Chemical Product and Process Modeling
3.	Dr. Radheshyam Rai	Journal of Alloys and Compounds, Journal of Sensor and Actuator, Solid State Communications, Advanced Material Letters, Materials Chemistry and Physics.

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

The School of Physics and Materials Science endeavors to attain academic excellence by further diversifying the teaching and research skills of the faculty. The university has been organizing various faculty development programs to recharge and boost the teachers. Eminent academicians, researchers and industry experts are invited as resource persons in such programs. Some of these have been listed as under:

Table PHYS-14: Faculties attend in-service training, orientation, refresher courses and workshops organized in and outside the University

S. No.	Faculty Name	(UGC, ASC, Refresher/orientation programs, workshops, training programs and similar programs)
Held in Shoolini University		
1.	All faculty	<p>“Scientific Writing”, 16th April, 2015 by Dr. Klaus von Gadow, University of Germany.</p> <p>“Innovation, Innovative Minds Impacting Change”, 6th April, 2015 by Dr. P.S. Ahuja, former Director General, CSIR.</p> <p>“Latest Trends and Scientific Innovations”, 20th March, 2015 by Dr. Niranjana Bilgi.</p> <p>“Optimization of Sampling Errors”, 2-3rd December, 2013.</p>

Other than the University		
2.	Dr. Atul Pandey	Five Days MHRD/AICTE Sponsored Winter School Conducted By NITTTR, Chandigarh (From 19/01/2009 To 23/1/2009). Workshop On “Akash” Conducted By IIT Bombay On 10th – 11th November, 2012. (Held Under The National Mission On Education Through ICT (MHRD)). Two Days Workshop on Antenna Materials At JUIT, Wagnaghat, Himachal Pradesh (On 14th-15th December 2012). One Day Workshop (ETIME-2011) On 4th February 2011, At Davcet, Kanina, Mohindergarh, Haryana
3.	Ms. Parul Sharma	International conference & workshop on Nanostructured ceramics and other nanomaterials, University Delhi, March 13-16, 2012. One week Workshop On nanotechnology fabrication and characterization, JUIT, Wagnaghat, H.P. December 11-18, 2013.

28. Student projects

Projects are a mandatory part of the course curriculum for each UG and PG program offered by the School. These projects expose the students to analytical thinking for innovative solution of today's big concern and enhance their expertise in theoretical and practical aspect of instrument operating skills.

- percentage of students who have done in-house projects including inter-departmental projects: **78%**
- percentage of students doing projects in collaboration with other universities/ industry / institute: **22%**

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

Faculty:

Table PHYS-15: Awards/recognitions received by the Faculty

S. No.	Faculty Name	Recognition/ Award	Conference	Year
1.	Dr. Suneel Dutt	Best Oral presentation	CMSDAS at SINP, Kolkata	October 2013.
2.	Ms. Parul Sharma	Best Poster award	Second National conference on Multifunctional Advanced Materials, Shoolini University, Solan, H.P.	June, 2014.

S. No.	Faculty Name	Recognition/Award	Conference	Year
3.	Mr. Virender Partap Singh	Best Poster award	International conference on “Emerging advanced technology and applied science” at AU, Baddi (H.P.) National conference on “Recent trends in emerging science, HSCA-3 at Govt. P.G. College, Mandi (H.P.)	May, 2015. April, 2015.

By Doctoral / post doctoral fellows- Nil

Table PHYS-16: Awards/recognitions received by the students

S. No.	Faculty Name	Recognition/Award	Conference	Year
1	Mr. Prashant	Best Poster presentation	National conference on Multifunctional Advanced Materials, Shoolini University, Solan, H.P	May, 2013
2	Ms. Sonika Rani	INSPIRE fellowship	-	2014

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

Table PHYS-17: List of seminars/conference/workshop/training programs organized by School of Physics & Materials Science

S. No.	Conference	Source of Funding	Date
1.	Second National conference on Multifunctional Advanced Materials Shoolini University, Solan, H.P.	ICMR, DRDO	June 11- 13, 2014
2.	National conference on Multifunctional Advanced Materials Shoolini University, Solan, H.P.	DRDO, DAE, DST INSA	May 2- 4, 2013.
3*	National Workshop on Advances in Electron Microscopy and Allied Fields, Shoolini University *	DRDO ISRO Electronics Society of India	September 2011

***Jointly organized with School of Chemistry**

31. Code of ethics for research followed by the departments:

Follows International code of ethics set by International Journals and books

32. Student profile programme-wise:**Table PHYS-18: Student profile of School of Physics & Materials Science**

Name of the program(Refer to Question no. 4)	Year	Applications Received	Selected		Pass Percentage	
			Male	Female	Male	Female
B.Sc. Physics	2012--13	9	1	0	-	-
	2013-14	6	1	5	-	-
	2014-15	7	2	3	-	-
M.Sc. Physics	2010-11	12	5	7	100	100
	2011-12	12	2	9	100	100
	2012-13	11	4	7	100	86
	2013-14	8	1	6	-	-
	2014-15	26	5	20	-	-
M.Phil. Physics	2012-13	2	0	2	-	100
	2013-14	1	0	1	-	100
Ph.D. Physics	2010-11	2	2	0	100	-
	2011-12	2	1	1	100	0
	2012-13	8	3	4	-	-
	2013-14	8	4	2	-	-
	2014-15	3	2	-	-	-

33. Diversity of students**Table PHYS-19: Diversity of students in School of Physics & Materials Science**

Name of the Program	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of the students from other countries
B.Sc.	Nil	92%	8%	Nil
M.Sc.	Nil	88%	12%	Nil
Ph.D.	11%	56%	33%	Nil

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

Table PHYS-20: Students who have cleared competitive exams

S. No.	Student Name	Award
1.	Ms. Shivani Thakur	Staff Selection Commission
2.	Ms. Jyoti	Bank PO

35. Student progression

Table PHYS-21: Student progression of School of Physics & Materials Science

Student Progression	Percentage against enrolled
UG to PG	Nil
PG to M.Phil.	Nil
PG to Ph.D.	9%
Ph.D. to Post-Doctoral	Nil
Employed	
Campus selection	17%
Other than campus recruitment	71%
Entrepreneurs	12%

36. Diversity of staff

The School of Physics and Materials Science has faculty with diverse background having done their degrees from reputed national and international Universities/ Institutes.

Table PHYS-22: Diversity of faculty members in School of Physics & Material Sciences.

Percentage of faculty who are graduates	
of the same University	11%
From other universities within the State	44.5%
From universities from other States	44.5%
From universities outside the country	Nil

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

Table PHYS-23: Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period.

S. No.	Name of Students	Degree Awarded	Year
1	Rajesh Kumar	Ph. D.	2014
2	Parul Sharma	M. Phil.	2010

38. Present details of departmental infrastructural facilities with regard to

Library:

Yogananda library of Shoolini University is fully digitized and houses text books, reference books, journals, magazines and newspapers both in hard bound and as e-resource sufficient for academic and research requirements of the students. All the e-resources are available to the faculty and students through Learning Management System (LMS) and Knowledge Management System (KMS). Yogananda library has subscription to a number of learning packages from EBSCO which includes more than a lakh e-books and ~9000 research journals etc.

In addition to central library each school has its own virtual library which is linked to the central library with a minimum physical books and journals. All the study material available in the central library can be easily used through school libraries. School library also contains thesis, dissertations, project reports etc.

Following is the study material related to School of Chemistry details are as follows:

Central and School library facilities are provided.

- (i) Central Library. 9982 books, 35 Physical journals and e-journals 510 provided by DELNET and wide range of 9000 plus e-journals provided by EBSCO
 - (ii) School Library: Developed as a Wi-Fi Hotspot for ready access to subject specific e-Journals and KMS. Also contains essential reference books.
-
- a) School library. Some reference books are maintained in the School library.
 - b) Internet facilities for staff and students Wi-Fi, LAN, IT
 - c) Total number of class rooms 02
 - d) Class rooms. with ICT facility 02
 - e) Students' laboratories 02

Table PHYS-24: List of Students' laboratories

S. No.	Name of Lab	Description
1	Electronic Lab	As per UGC requirements
2	Optics Lab (Dark Room)	As per UGC requirements

f) Research Laboratories

04

Table PHYS-25-List of Research laboratories description

S. No.	Name of Lab	Description of research work
1.	Nanotechnology Laboratory-I	Soft & hard ferrites, nanomagneto dielectric materials, multiferroics, high density memory storage devices
2.	Nanotechnology Laboratory-II	The study of magnetic and electrical properties.
3.	Ferroelectric Research Laboratory	Synthesis of ferroelectric, piezoelectric, and ferro-electromagnetic materials, ceramics
4.	Experimental High Energy Physics Laboratory	Search for Beyond Standard Model Physics with Lepton and Jets Final States.

g) List of research facilities:

Table PHYS-26: List of research facilities

S. No.	Name of Facility	Description
1.	Instrumentation Facility in Nanotechnology Research Lab	DC resistivity set up, PE loop tracer, Curie temperature measurement kit, Furnace, Hydrollic press, Centrifuge.
2.	Instrumentation Facility Ferroelectric Reasearch Lab	Furnace, hydrollic press, centrifuge, ultrasonic.
3.	Instrumentation Facility Experimental High Energy Physics	UPS, Work Stations, Networking.

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

a) From the host institution/university

Table PHYS-27: The list of doctoral students from the host university

S. No.	Registration No.	Name of the student
1	13-PHY-D-03	Shilpi Chandel
2	13-PHY-D-08	Shalini Thakur
3	14-PHY-D-01	Madan Lal

b) From other institutions/universities:

Table PHYS-28: The list doctoral students from other universities.

S. No.	Registration No.	Name of the student
1	PHY-10-D-01	Naveen Kumar
2	PHY-10-D-02	Rajesh Sharma
3	PHY-11-D-01	Manjeet Singh
4	PHY-11-D-02	Shweta Thakur
5	12-PHY-D-01	Rishika Bhardwaj
6	12-PHY-D-02	Parul Sharma
7	12-PHY-D-03	Shyam Singh Thakur
8	12-PHY-D-04	Kush Rana
9	12-PHY-D-08	Ashish Saini
10	12-PHY-D-05	Mamta
11	12-PHY-D-09	Ms. Poonam Kumari
12	13-PHY-D-01	Rajinder Kumar
13	13-PHY-D-02	Pravendra Kumar
14	13-PHY-D-04	Saroop Chand
15	13-PHY-D-05	Ajay Kumar
16	13-PHY-D-06	Bikram Singh
17	13-PHY-D-07	Bipen Singh
18	14-PHY-D-02	Sudesh Kumar

40. Number of post graduate students getting financial assistance from the university-03

Several PG and research students receive financial assistance from the university. Following is the list of students who have received financial assistance from the university:

Table PHYS-29: List of student in School of Physics & Materials Science are getting financial assistance from university.

S. No.	Student Name	Course
1	Bhavana Suri	M.Sc. Physics
2	Shalini Thakur	Ph.D. Physics
3	Rishika Bhardwaj	Ph.D. Physics

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

Yes, the need for new programs and courses is assessed from the time to time. Dean of the Faculty proposes new programs. On basis of inputs from the stake holders including the potential employers, academicians, faculty members of the School and alumni. Board of Studies committee is constituted with three external experts. The proposal is put up with Board of Studies which then assesses the need and suggests their recommendations. After completing the exercise the proposal is forwarded to Academic Council for approval.

42. Does the department obtain feedback from

a) Faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

Yes, feedback is obtained from the faculty on curriculum as well as teaching – learning–evaluation. Revision of the syllabus is done on a regular basis in the faculty meetings, and the Board of Studies meetings. Thereafter, all the comments and suggestions are looked into for formulating revised syllabi, designing of the practical and hence, improving the teaching-learning process.

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

Yes, feedback is obtained from the students on staff, curriculum and teaching-learning-evaluation by Dean Academic Affairs. The feedback is shared with the faculty and staff to help them improve the teaching skills. The feedback is also taken into consideration for improving the curriculum and teaching-learning-evaluation.

c) Alumni and employers on the programs offered and how does the department utilize the feedback?

Yes, feedback is obtained from alumni and employers on the programs offered regularly during their visits to the campus. The feedback is utilized in designing and revision of the curriculum based on the experience of alumni in their work places.

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

Our University is too young to have distinguished Alumni as it is only five years old. However, we have alumni who are not distinguished but are on the path of success.

Table PHYS-30. List of some well placed students.

S. No.	Student Name	Course Studied	Current Occupation
1.	Rajesh Kumar	Ph.D. Physics	Associate Professor
2.	Manjeet Singh	Ph.D. Physics	PGT Physics

S. No.	Student Name	Course Studied	Current Occupation
3.	Naveen Kumar	Ph.D. Physics	PGT Physics
4.	Sunaina Chandel	M.Phil. Physics	PGT Physics
5.	Beena Kumari	M.Sc. Physics	PGT Physics
6.	Vipan	M.Sc. Physics	PGT Physics
7.	Vinay Pathania	M.Sc. Physics	PGT Physics
8.	Sunaina Minhas	M.Sc. Physics	PGT Physics
9.	Shailja Kumari	M.Sc. Physics	PGT Physics
10.	Jyoti Kumari	M.Sc. Physics	Bank PO

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

School of Physics & Materials Science organizes workshops, conferences and guest lectures from time to time wherein external experts are invited to deliver lectures on the current topics of Physics. The details are given below:

- National conference on Multifunctional Advanced Materials, Shoolini University, Solan, H.P. from May 2-4, 2013. The conference included expert lectures on Nanomaterials, antenna applications, high density memory storage devices etc.
- Second National conference on Multifunctional Advanced Materials, Shoolini University, Solan, H.P. June 11-13, 2014. The conference included expert lectures on Nanomaterials, Nanomedicine, Smart materials etc.
- Six day workshop “National Workshop on Advances in Electron Microscopy and Allied Fields (NWAEMA-2011)” held in Shoolini University, September 2011, Organized by School of Chemistry and Physics. The seminar included expert lectures on application of SEM, TEM, techniques in various fields and visit to SAIF lab Panjab University, Chandigarh for exposure to various instruments and their working.
- Guest lectures by
 - Dr. Suman Bala Beri, Punjab University, Chandigarh
 - Dr. R. Ratheesh, C-MET, Thrissur
 - Prof. Vinay Gupta, University of Delhi
 - Prof. Ravi Kumar, NIT, Hamirpur
 - Dr. Manjeet Singh, Director, TBRL
 - Prof. Mahavir Singh, Department of Physics, HPU, Shimla
 - Prof. S.S. Bhatti, Panjabi University, Patiala
 - Dr. Monika Tomar University of Delhi, Delhi
 - Dr. J. C. Kuniyal G.B. Pant Institute, Mohal, Kullu
 - Prof. P.B. Barman, JUIT, Wagnaghat, H.P.

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

The traditional chalk/talk is supplemented by using modern teaching methods along with the use of LCD projector-based presentations, using available internet connection. In addition, seminar presentations by the students; subject assignments given for each course are constantly done to ensure student's understanding and progress in the subjects. Performance and results of the students are analyzed thoroughly to identify the major strengths and weaknesses of the students. Regular practical classes are allotted for the UG and PG students. Each student has to perform the experiment either individually or in a small group by themselves following the demonstration of the same by the teacher. Beyond the textbook, UG and PG are given hand-on research experience under the supervision of a mentor for their research projects. The detailed list of teaching methods include:

Lecture method: Teaching is done by using the chalk and talk and power point presentations

Interactive Teaching: The Interactive method includes audio-visual aids, live demonstrations with group discussion.

Project based learning: The minor and major projects related to research work are done by U.G. and P.G. students

Lab and industrial visits: Training in industries and R&D institutions is a mandatory part of course curriculum in undergraduate programs

Experimental learning: The theoretical teaching concepts are supported by experimental learning as practical's.

Other Activities: The subject related seminars, extempore, quizzes and assignments are given to U.G. and P.G. students.

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

The curriculum has clearly defined objectives and outcomes. The continuous evaluation system is based around measuring the learning outcomes of the course. The learning outcomes are monitored by continuous evaluation program including internal examinations, quizzes, surprise tests, assignments, seminars and viva-voce. The progress in achieving the program objectives is periodically monitored by faculty meetings, student interactions, Board of Studies and interaction with other stake holders.

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

Students and faculty work together in the extension activities organized from time to time. Some of these are given as:

- Science Projects in Tech Fest on May, 2014.
- Participation in "Marathon" on Teachers Day every year.
- "Swachh Bharat Abhiyan", 2nd October 2014 and 5th April 2015.
- "Science Day" celebrations on 28th February, every year.

- “National Drinking water and sanitation Awareness Day” on 19th March, 2015.
- “Earth Day” celebrations on 22nd April, 2015.
- Expert lectures in Physics in remote Schools of Himachal Pradesh

University Level Extension Activities:

- International Yoga Day
- Science Exhibition
- Earth Day
- Environment Day
- Teachers Day

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

Some of the activities of the School of Physics & Materials Science are done like seminars, workshops, conferences, training programs, industrial visits & trainings, invited talks, etc. are regularly organized to keep the students well informed about the developments in the field of Physical sciences.

Following is the list of activities in the School of physics and materials Science under these programs students getting benefits.

Table PHYS-31: List of various programs in university with other university.

S.No.	Faculty	Name of Program	Institute/organization
1.	All Faculty	Science Inspire Program (for 10 th and 12 th classes students from different Schools)	Shoolini University
2.	Dr. Atul Thakur and Dr. Preeti Thakur	Summer Training Programmes (for students from other Institute/organization)	Sri Guru Granth Sahib World University, Fatehgarh, Punjab.

49. State whether the programme/ department is accredited/ graded by other agencies? If yes, give details. No

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

The School of Physics & Materials Science is actively engaged in generating new knowledge pertaining to:

- Fabrication of substrate for patch antenna by using nano magneto-dielectric materials for missile applications
- Nano magneto-dielectric materials for radar absorbing materials,
- Nanomaterials synthesis for memory storage devices
- Energy harvesting by piezoelectric materials
- Search for Physics beyond Standard Model

- Harvesting Solar energy for steam cooking implemented in Shoolini University Girls Hostel
- Students at UG and PG level are motivated towards research through research projects.
- Research papers are published in reputed journals by research focused faculty.

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

Strengths:

Research Projects: School of Physics & Materials Science has research projects worth Rs. 85 lakhs from the funding agencies such as DRDO, DAE, and DST etc.

Student exchange programme: Collaborations with reputed International Institutions wherein student exchange programme is implemented with six students of M.Sc. Physics studying one semester (Feb-June, 2015) at Chung Yuan Christian University, Taiwan. One student of B.Sc. (Hons) Physics has completed one semester (Aug-December, 2014) at Gachon University, South Korea.

Summer training programme: Eight students of Sri Guru Granth Sahib World University, Fatehgarh Sahib, Panjab completed their six weeks summer training programs. from June- July, 2014 in School of Physics & Materials Science.

Research based curriculum: School of Physics & Materials Science has introduced compulsory project work in UG and PG courses for enriching the student for modern developments.

Research oriented faculty: The School has highly qualified research oriented faculty having research publications in high impact reputed International Journals having scope for development through interdisciplinary subjects.

Weaknesses:

International Funding: Being a newly established university, the need is to generate international funding and research collaborations. Faculty is working hard in this direction by establishing different collaborations and planning to write joint projects.

High End Instrumentation Facilities: Currently the School is having basic equipments and lab facilities but lack in high-end instrumentations. The School faculty will work to set these equipments through collaborative projects and funds from other agencies

Patents: This is an area where the School needs to work and faculty members are planning to go for applying for the patents of relevant research.

Industrial Exposure and consultancy: Currently the School is not providing enough industrial experience to the students. For improving on this end, School will work on establishment of linkages and collaboration with industry.

Opportunities:

Establishment of high performance computing center (HPCC): Experimental high energy Physics group is involved with simulation activities at a very high scale. This opens up the opportunity of setting up a high performance computing center with modern facilities. The School will develop this into International centre where researches from other institute could execute their simulation jobs.

Playing lead Role in collaborative research work: Being one of few Schools in India with research facilities like Research center in Nanotechnology, School will play leading role in collaborative research work.

Research collaboration with International Universities: School has well established international collaboration with different Universities. School provides the opportunity for the students to learn new tools and techniques and work culture from the leading research laboratories across the globe.

Challenges:

Attracting Major Projects: School of Physics and Materials Science has been successful in getting smaller grants from funding agencies. Now, it aspires to obtain high-level projects for the overall development and improvement of its research infrastructure.

Development of International Standard Labs: In order to further improve the quality of research and impart international standard practical training to the students, the infrastructure of the labs should also be enhanced to international level.

Attracting Good Quality Students and Faculty: It is normally difficult to attract highly motivated and talented students and faculty at a private university as they often choose to seek government institutes. The general perception among the students is that private institutes do not conduct quality research. The School is endeavoring to change this perception by attracting high quality faculty, obtaining more research grants and generating high impact publications.

Improving Technical Skills of the Students: It has been observed that the technical skills of the fresh graduates is not always as per the requirements and

expectations of the industry. This may be due to less exposure of the students to industrial environment during their course of study. Thus, in order to bridge the gap between industry expectations and technical skills of students, they need to spend more time in the industrial set-up and have hands-on experience from the technical experts of the industry.

52. Future plans of the School:

School of Physics and Materials Science at Shoolini University has been engaged in offering a quality Master's and Ph. D. program in Physics. The School plans to expand vigorously in the next few years both in terms of people and creating resources so as to get high end equipments which are all critical to pursue a very high quality academic and research program of very high accolade. The School will continue to work towards achieving the following aims:

Further Enhancing the Employability of Students through Skill Development Programs:

School of Physics and Materials Science recognizes the importance of skill development of the students. The School intends to provide quality infrastructure and training support to facilitate learning, apprenticeships, profession specific skill development, soft skills, e-learning, training for self-employment and entrepreneurial training. A university/School level mechanism will be developed to plan, implement and monitor the skill development of the students. The skill development programs will be aligned with National Skill Development Program. These steps would ensure that the students become globally competent in the job market.

National and International Collaboration for Research and Academic Exchange:

The School intends to collaborate with reputed national and international institutes of excellence in education and research to improve research capabilities. Opportunities for academic exchange both for faculty and students are being explored. The focus would be on sharing the research expertise, instrumentation, lab facilities and student exchange.

Efforts to Attract Extramural Project Grants:

School plans to attract extramural funding through collaborative projects. The School would work to obtain extramural research projects of national importance from national and international funding agencies in order to boost up and strengthen its research set-up. The idea is to conduct high quality product/ result oriented research in diversified areas of pharmaceutical sciences with clearly defined deliverables. School would also work to increase industrial collaborative and consultancy projects.

6. Evaluative Report of School of Pharmaceutical Sciences

The School of Pharmaceutical Sciences under the Faculty of Pharmaceutical Sciences is approved by Pharmacy Council of India (PCI) and AICTE and has Memorandums of Understanding collaborations with several reputed multinational pharmaceutical industries for the student internship / training and research activities. The School is focusing its research efforts on utilization of Himalayan flora for drug discovery for diseases of national relevance. The curriculum is designed to meet the contemporary requirements of industry and academia and focus is on skill development so that the graduates from the School are job ready, globally competent and play an important role in national development. The core values of the School are quality curriculum design and delivery, maintaining student centered approach in teaching as well as stimulating the quest for excellence in research and scholarship among students. The focus is on productivity in terms of discovery of new knowledge and improving the existing technology & methodologies in the laboratories and classrooms. The School strives to inculcate a value-based system in its students, a commitment to life-long learning, community service and social responsibility.

- 1. Name of the Department:** School of Pharmaceutical Sciences
- 2. Year of establishment:** 2009
- 3. Is the Department part of a School/Faculty of the university?**

Yes, School is the part of Faculty of Pharmaceutical Sciences.

- 4. Names of programs offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.):**

School of Pharmaceutical Sciences offer following programs:

- B. Pharmacy
 - M. Pharmacy (Pharmaceutics)
 - M. Pharmacy (Pharmaceutical Chemistry)
 - M. Pharmacy (Pharmacology)
 - M. Pharmacy (Drug Regulatory Affairs)
 - Ph.D. (Pharmaceutical Sciences)
- 5. Interdisciplinary programs and departments involved:**
 - a) Pharmaceutical Sciences programs supported by other Schools**

Pharmaceutical Sciences is a multidisciplinary science, which involves support from various Schools across the faculties. Following is the list of other Schools involved in the teaching of selective courses taught under different programs of Pharmaceutical Sciences:

Table PH01: List of Pharmaceutical Sciences programs supported by other Schools

S. No.	Programs	Schools
1.	B. Pharmacy	School of Biotechnology, School of Bioengineering and Food Technology, School of Business Management and Liberal Arts, School of Electrical and Computer Science Engineering, School of Chemistry
2.	M. Pharmacy (Pharmaceutics)	School of Biotechnology, School of Business Management and Liberal Arts
3.	M. Pharmacy (Pharmaceutical Chemistry)	School of Chemistry, School of Business Management and Liberal Arts
4.	M. Pharmacy (Pharmacology)	School of Business Management and Liberal Arts
5.	M. Pharmacy (Drug Regulatory Affairs)	School of Business Management and Liberal Arts
6.	Ph.D. (Pharmaceutical Sciences)	School of Electrical and Computer Science Engineering

6. Courses in collaboration with other universities, industries, foreign institutions, etc.:

None, but these are planned for future.

7. Details of programs discontinued, if any, with reasons:

M. Pharmacy (Pharmacognosy), M. Pharmacy (Quality Assurance) and M. Pharmacy (Pharmaceutical Biotechnology) were discontinued because the number of students joining the program was less than five in each branch. This was done in accordance with the directions of H.P. Private Educational Institutions Regulatory Commission (HP-PERC).

8. Examination System: Annual/Semester/Trimester/Choice Based Credit System:

- Since its inception, School of Pharmaceutical Sciences has followed semester and OCPA/OGPA grading system for B. Pharmacy and M. Pharmacy as per PCI guidelines.
- From the session 2015-16, Choice Based Credit System has been adopted while meeting the PCI requirements.
- As per PCI guidelines (Gazette Notification no.: 14-136/2014-PCI), annual system for M. Pharmacy has been adopted from 2015-16.

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

Yes, the School is actively exchanging faculty in programs run by other Schools. Since, the university is offering Choice Based Credit System, the School is participating in electives offered by other Schools. Following is the list of courses or electives taught by School of Pharmaceutical Sciences for programs of other Schools:

Table PH02: Courses or electives taught/ offered by School of Pharmaceutical Sciences for programs run by other Schools

Courses/ Electives	Program	School
Pharmaceutical Biotechnology and Healthcare	B. Tech (Biotechnology)	School of Bioengineering and Food Technology
Drug Discovery & Toxicology	B. Tech (Bioinformatics)	School of Electrical and Computer Science Engineering
Anatomy Physiology and Health Education	MBA (Pharma and Healthcare)	School of Business Management and Liberal Arts

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

Following are the posts sanctioned and filled in School of Pharmaceutical sciences as per PCI/AICTE norms:

Table PH03: Posts sanctioned and filled as per PCI/AICTE norms

Posts	Sanctioned	Filled
Professor	02	01
Associate Professors	04	03
Asst. Professors	16	13
Others	-	-

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

a) Faculty members from School of Pharmaceutical Sciences

School of Pharmaceutical Sciences has experienced post-doctoral, doctoral and post-graduate faculty members with expertise in different fields of pharmaceutical Sciences. Following is the list of faculty members for School of Pharmaceutical Sciences:

Table PH04: List of current faculty for School of Pharmaceutical Sciences

Name	Qualification	Designation	Specialization	Years Of Experience	Ph.D.**/ M.Phil.* Students guided for the last 4	Ph.D./ M.Phil.* Students currently guiding
Prof. Neeraj Mahindroo	Ph.D.	Professor	Pharmaceutical Chemistry	15	Guided 2 M. Pharmacy	Guiding 5 Ph.D. + 3 M. Pharmacy
Dr. Rohit Goyal	Ph.D.	Associate Professor	Pharmacology	7.5	Guided 10 M. Pharmacy	Guiding 3 Ph.D. + 2 M. Pharmacy
Dr. Deepak N. Kapoor	Ph.D.	Associate Professor	Pharmaceutics	7.0	-	Guiding 3 Ph.D. + 1 M. Pharmacy
Dr. Sameer Sapra	Ph.D.	Associate Professor	Pharmaceutical Chemistry	6.5	Guided 6 M. Pharmacy	Guiding 3 Ph.D. + 1 M. Pharmacy
Dr. Afroz Alam	Ph.D.	Assistant Professor	Pharmaceutical Chemistry	6.5	Guided 12 M. Pharmacy	Guiding 1 M. Pharmacy
Dr. Poonam Negi	Ph.D.	Assistant Professor	Pharmaceutics	6.0	-	Guiding 1 Ph.D. + 2 M. Pharmacy
Dr. Parveen Kumar*	Ph.D.	Assistant Professor	Pharmacology	3	-	-
Dr. Gunjan Goel	MBBS	Assistant Professor	Medical Sciences	14	-	-
Mr. Vikas Sharma	M. Pharmacy	Assistant Professor	Pharmacognosy	6.10	Guided 3 M. Pharma	Guiding 1 M. Pharmacy
Ms. Shaila Khah	M. Pharmacy	Assistant Professor	Pharmacology	5.1	Guided 1 M. Pharm	-
Mr. Navneet Kumar Upadhyay	M. Pharmacy	Assistant Professor	Quality Assurance	5.6	Guided 5 M. Pharmacy	-
Ms. Swati Pundir	M. Pharmacy	Assistant Professor	Pharmacognosy	2.1	-	-
Mr. Gaurav Sharma	M. Pharmacy	Assistant Professor	Pharmacology	2.1	-	-
Ms. Hemlata	M. Pharmacy	Assistant Professor	Pharmaceutics	2	-	-
Ms. Tanurajvir Kaur	M. Pharmacy	Assistant Professor	Pharmaceutics	1.7	-	-

Name	Qualification	Designation	Specialization	Years Of Experience	Ph.D.**/ M.Phil.* Students guided for the last 4	Ph.D./ M.Phil.* Students currently guiding
Aditya Shiven	M. Pharmacy	Assistant Professor	Pharmaceutics	-	-	-
Namrata Sharma	M. Pharmacy	Assistant Professor	Pharmacognosy	-	-	-

In the School of Pharmaceutical Sciences, M. Pharmacy is a research degree, thus, included in the list. Student of M. Pharmacy spends two semesters out of four for pursuing research problem and submit research dissertation on completion of the work.

* Consent received.

**Professor K.L. Dhar, who has left and was full time faculty of the School, guided 5 Ph.D. students.

b) Faculty members from other Schools teaching at School of Pharmaceutical Sciences

The School of Pharmaceutical Sciences runs interdisciplinary courses such as Computers, Programming & Applications, Remedial Mathematics and Pharma Management, which require additional faculty from other Schools. Following is the list of faculty members from other Schools taking these courses in the School of Pharmaceutical Sciences:

Table PH05: List of Faculty Members from other Schools

Name of faculty	Qualification	Designation	Specialization	Experience	School
Ms. Meenakshi Nayyer	M. Tech	Assistant Professor	Computer Sciences	7 Years	School of Electrical and Computer Science Engineering
Dr. Alok D. Kothiyal	Ph.D.	Assistant professor	Mathematics	7 Years	School of Mechanical and Civil Engineering
Dr. Saurabh Kulshrestha	Ph.D.	Associate Professor	Biotechnology	6 Years	School of Biotechnology
Mr. Sharad	MS (IT)	Assistant Professor	Communication	5 Years	School of Mechanical and Civil Engineering
Mr. Narender Verma	B. Tech, PGDM	Associate Professor	Management	14 Years	School of Business Management and Liberal Arts

12. List of Senior Visiting Fellows, Adjunct Faculty, Emeritus Professors

To enhance global competency and professionalism among students, the School of Pharmaceutical Sciences involves Adjunct and Visiting Faculty to train the students in specialized areas of pharmaceutical sciences. Following is the list of Visiting Faculty and Adjunct Faculty for the School:

Table PH06: List of Visiting Faculty and Adjunct Faculty

S. No.	Category	Name	Organization
1.	Adjunct Professor	Dr. Kaushik Das Sarma, MS, Ph.D.	Head, Pigment R&D, Sudharshan Chemicals Pvt. Ltd., Pune, Maharashtra
2.	Adjunct Professor	Dr. Paras Prakash, M. Pharmacy, Ph.D.	Managing Principle Consultant, Pantellisense Research, Shimla
3.	Visiting Faculty	Dr. Amarjeet Singh, M. Pharmacy, Ph.D.	President, R&D, Regulatory Affairs, Tirupati Medicare Ltd., Paonta Sahib, H.P.
4.	Visiting Faculty	Dr. Kamal Dua, M. Pharmacy, Ph.D.	School of Biomedical Sciences and Pharmacy, University of New Castle, NSW, Australia.
5.	Visiting Faculty	Mr. Sumit Gupta, B.Tech., MBA	Director, Meridian Medicare Ltd., Solan, H.P.

13. Percentage of classes taken by temporary faculty – program-wise information: Nil

14. Program-wise Student Teacher Ratio:

S.No.	Program	Student Teacher Ratio
1.	B. Pharmacy	14.85:1
2.	M. Pharmacy	10:1

AICTE/PCI norms state B. Pharmacy ratio as 15:1 and M. Pharmacy ratio as 12:1

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

Table PH07: List of Academic support and administrative staff

S. No.	Staff	Sanctioned	Actual
1.	Academic Support Staff (Technical)	13	13
2.	Administrative Staff	09	04+05*

*Five administrative staff members are deputed for central administrative for Pharmacy work.

16. Research thrust areas as recognized by major funding agencies:

The School in alliance with the university research philosophy is focusing its research efforts on sustainable utilization and conservation of Himalayan biodiversity. The major thrust areas of the School are natural product and herbal based drug discovery, medicinal chemistry, formulation design and development, pre-clinical studies on diseases of national relevance. To promote the global competencies of the students the international research and ethical standards are followed by the School. Following four research thrust areas have been identified by the funding agencies:

- Natural product chemistry - Isolation & characterization of bioactive leads.
- Evaluation of biological activity like Anticancer, Anti-osteoporotic, Anti-asthmatic etc.
- Medicinal Chemistry studies for lead identification and optimization
- Stability studies of drugs.

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

a) National Projects:

Faculty from School has been successful in getting grants on projects based on natural product research on the areas aligned with the university research philosophy. Following are the projects granted by different funding agencies to faculty and students:

Table PH08: List of faculty projects

S. No.	Project Name	Investigator	Funding Agency	Amount (₹)
1.	Isolation & characterization of bioactive leads from <i>Pinus</i> for prevention of osteoporotic	Dr. Rohit Goyal	DST, New Delhi	2,130,000.00
2.	Bioactivity guided Isolation and structural modification of herbal principles from Himachal Pradesh.	Dr. Rohit Goyal (PI) & Mr. Vikas Sharma (CO-PI)	ICMR, New Delhi	1,030,000.00
3.	Evaluation of withanolide lactones as Immunomodulators to induce granulysin expression in immune cells conferring	Dr. Reena V. Saini (PI) & Prof. Neeraj	DBT, New Delhi	2,500,000.00

	cytotoxicity towards cancerous cells	Mahindroo (CO-PI)		
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Table PH09: List of student projects

S. No.	Project Name	Investigator	Funding Agency	Amount (₹)
1.	Development of validated stability Indicating assay method for TAZQ, a novel bronchodilator and comparative accelerated degradation of digoxin and its acetate	Ms. Megha Sharma under the supervision of Prof. Neeraj Mahindroo	DST-INSPIR, New Delhi	1,700,000.00
2.	Isolation, characterization and biological evaluation of novel phytoconstituents for anti-cancer activity.	Mr. Sunil Tomar under the supervision of Prof. Neeraj Mahindroo	DST-INSPIRE New Delhi	1,700,000.00
3.	Synthesis and pharmacological evaluation of nitrogen heterocycles with special emphasis on quinoline analogues	Ms. Kamna Sharma under the supervision of Dr. Sameer Sapra	DST-INSPIRE , New Delhi	1,700,000.00

b) International projects:

Nil

c) Total grants:

₹1,28,90,000/- (One Crore Twenty Eight Lakhs Ninety Thousand Only) including INSPIRE grants

18. Inter-institutional collaborative projects and associated grants received

a) National collaboration:

At the School of Pharmaceutical Sciences, importance of collaborative projects with other institutes or industry is well appreciated. The School has initiated collaborations in form of small projects with pharmaceutical industry and intends to encourage such tie-ups at a higher level. Following is the list of collaborative projects initiated with industry:

Table PH10: list of inter-institutional national collaborations

S. No.	Name of PI	Project Name	Collaborator	Grant Received (₹)
1.	Prof. Neeraj Mahindroo & Dr. Poonam Negi	Development of nano formulations of Vitamin D3	Tirupati Medicare Ltd., Paonta Sahib, H.P.	30,000.00
2.	Dr. Deepak Nandkishore Kapoor	Development of anti-diabetic herbal formulation containing protein supplement	Tirupati Medicare Ltd., Paonta Sahib, H.P.	50,000.00
3.	Dr Atul Thakur & Prof. Neeraj Mahindroo	Size reduction of vitamin D ₃ to nano scale.	Tirupati Medicare Ltd., Paonta Sahib, H.P.	20,000.00
4.	Prof. Neeraj Mahindroo, Dr. Deepak N Kapoor & Dr. Poonam Negi	Development of multi-vitamin gummies & chewable tablets.	Meridian Medicare Pvt. Ltd, Solan, H.P	50,000.00
5.	Dr. Rohit Goyal	2-(2-Arylphenyl) benzoxazole as a novel anti-inflammatory scaffold: Synthesis and biological evaluation	Dr. AK Chakraborty, NIPER, Mohali	20,000.00
6.	Prof. Neeraj Mahindroo	Small molecule modulators of Hedgehog-Gli pathway	Dr. Uday Banu, Jaypee University of Information Technology, Waknaghat, Solan H.P.	20,000.00
7.	Prof. Neeraj Mahindroo	Investigation of North-Western Himalayan plants for anti-malarial activity	Dr. Rakesh Sehgal, Head Department of Parasitology, PGIMER, Chandigarh	20,000.00

S. No.	Name of PI	Project Name	Collaborator	Grant Received (₹)
8.	Ms. Shaila Khah	Investigation of bioactive leads for prevention of bronchial asthmatic syndrome	Prof. Kulbhushan Tikoo, Professor, In-charge, Pharmacology and Toxicology, NIPER, Mohali	20,000.00

b) International collaboration:

Table PH11: list of inter-institutional international collaborations

S. No.	Name of PI	Collaborator	Project Name	Grant Received
1.	Prof. Neeraj Mahindroo	Dr. Jih-Hwa Guh, Dean, School of Pharmacy, National Taiwan University, Taipei, Taiwan	Design, synthesis and evaluation of Hh-Gli pathway modulators	Under evaluation

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

20. Research facility / centre with

- State recognition: Nil
- National recognition: Animal House approved by Committee for Purpose of Control and Supervision of Experiments on Animals (CPCSEA), New Delhi
- International recognition: Nil

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

The School has two research laboratories sponsored by industry:

- Tirupati Drug Delivery Research Laboratory
- Meridian Formulation & Development Laboratory

22. Publications:

Number of papers published in peer reviewed journals (national / international): 79

Number in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.):

- **In Scopus: 31**

h-index: 3

Citation Index –Range /Average

- Range: 0-8
- Average = 2

Impact Factor Range: 0.2-10.72

SNIP: -

SJR: -

List of publications:

Following is the list of publications for School of Pharmaceutical Sciences:

1. Abhi V, Joseph L, George M. Phytochemical analysis of fruit extract of *Myrsine Africana*. *International Journal of Pharmacy and Pharmaceutical Sciences*. 2011, 3: 427- 430.
2. Alam A, Dhar KL, Jayshree BS. Isolation and biological evaluation of new isoflavones from *Iris kashmiriana*. *Medicinal Chemical Research*. 2015. **(IF:1.61)**
3. Alam A, Dhar KL, Jayshree BS. Synthesis of new series of chalcones and their antioxidant, antibacterial and cytotoxic activity. *International Journal of Recent Scientific Research*. 2014, 4: 354-359. **(IF:2)**
4. Alam A, Dhar KL, Jayshree BS. Synthesis, Characterization and cytotoxic activity of flavonoids. *Journal of Pharmaceutical Sciences*. 2013,3:65-72.
5. Ali S, Pandit V, Sekhar C. Technology Transfer in Pharmaceuticals. *International Research Journal of Pharmacy*. 2012, 3:43-48.
6. Bande M, Nepali K, Goyal R, Thakur V, Suri J, Budhiraja RD, Suri OP, Singh PM, Dhar KL. Evaluation of antiasthmatic activity of 7, 8, 9, 10-tetrahydroazepino [2, 1-b] quinazolin-12 (6H)-one in combination with ambroxol in Guinea pigs. *Medicinal Chemistry Research*. 2012, 21:4158-4167. **(IF: 1.61)**
7. Bansal S, Vyas S, Bhattacharya S and Sharma M. Catechin prodrugs and analogs: a new array of chemical entities with improved pharmacological and Pharmacokinetic properties. *Natural Product Reports*. 2013, 30:1438-1454. **(IF: 10.72)**
8. Budhiraja A, Kadian K, Kaur M , Aggarwal V, Garg A, Sapra S, Nepali K, Suri OP, Dhar KL. Synthesis and biological evaluation of naphthalene, furan and pyrrole based chalcones as cytotoxic and

- antimicrobial agents. *Medicinal Chemistry Research*. 2013, 21:2133-2140. **(IF:1.5)**
9. Budhiraja A, Kumar S, Nepali K, Kaul S, Dhar KL. Community analysis of endophytic fungi in medicinal plant *Gloriosa superba*. *Advances in Human Biology*. 2013,3:15-20.
 10. Budhiraja A, Nepali K, Gautam V, Sapra S and Dhar KL. Quantitative determination of a novel pseudo alkaloid colchatetralene isolated from the mycoflora of *Gloriosa superba* Linn by HPTLC. *Natural Products Journal*. 2013, 3:176-181. **(IF:2.248)**
 11. Budhiraja A, Nepali K, Sapra S, Verma S, Dhar KL. Bioactive metabolites from an endophytic fungus of *Aspergillus* species isolated from the seeds of *Gloriosa Superba* Linn. *Medicinal Chemistry Research*. 2013, 22:323-329. **(IF:1.61)**
 12. Chandel A, Ptail V, Goyal R, Dhamija H, Parashar B. Ethosomes: A Novel approach towards transdermal drug delivery. *International Journal of Pharmaceutical and Chemical Sciences*. 2012, 1:563-569.
 13. Chawla G, Jain N. Mouth dissolving tablets: an overview. *International Journal of Pharmaceutical Sciences and Research*. 2011, 3:2919-2925.
 14. Chopra B, Dhingra AK, Dhar KL. *Psoralea cordyfolia* L (Buguchi) - folklore to modern evidence: Review. *Fitoterapia*. 2013, 90:44-56.
 15. Goyal R, Ravishanker B, Shukla BJ, Singh M. Hepatoprotective activity of Rohitaka ghrita against paracetamol induced liver injury in rat. *Pharmacologia*. 2012, 3:227-232.
 16. Goyal R, Sharma PL. Possible Mechanism of *Plumbago zeylanica* Prevention of Hepatic Damage in Wistar Rat. *American Journal of Pharmacology and Toxicology*. 2012, 7: 101-108.
 17. Gupta R, Goyal R, Bhattacharya S, Dhar KL. Antioxidative in-vitro and Antiosteoporotic activities of *Prinsepia utilis* Royle in female rats. *European Journal of Integrative Medicine*. 2014, 7: 157-163 **(I.F. 0.61)**.
 18. Jain M, Kapadia R, Jadeja RN, Thounaojam MC, Devkar RV, Mishra SH. Traditional uses, phytochemistry and pharmacology of *Tecomella undulata*- A review. *Asian Pacific Journal of Tropical Biomedicine*. 2012, 2:1918-1923. **(IF: 0.926)**
 19. Jain M, Kapadia R, Jadeja RN, Thounaojam MC, Devkar RV, Mishra SH. Hepatoprotective potential of *Tecomella undulata* stem bark is partially due to the presence of betulinic acid. *Journal of Ethnopharmacology*. 2012, 143:194-200. **(IF: 2.99)**
 20. Jain M, Kapadia R, Jadeja RN, Thounaojam MC, Devkar RV, Mishra SH. Amelioration of carbon tetrachloride induced hepatotoxicity in rats by standardized *Feronia limonia*. Linn leaf extracts. *Experimental and Clinical Sciences Journal*. 2012, 11: 250-259.

21. Jain M, Kapadia R, Jadeja RN, Thounaojam MC, Devkar RV, Mishra SH. Protective role of standardized *Feronia limonia* stem bark methanolic extract against carbon tetrachloride induced hepatotoxicity. *Annals of Hepatology*. 2012, 11: 935-943.
22. Jain N, Sareen R, Dhar KL. In-situ solubility modulation for osmotic flow of cefadroxil through asymmetric membrane capsules. *Rajiv Gandhi University of Health Sciences Journal of Pharmaceutical Sciences*. 2012, 2:26-40.
23. Jain N, Sareen R, Mahindroo N, and Dhar KL. Development and optimization of osmotically controlled asymmetric membrane capsules for delivery of solid dispersion of lycopene. *The Scientific World Journal*. 2014. (IF: 1.219)
24. Jayashree BS, Alam A, Kumar V and Nayak Y. Antioxidant and antibacterial activity of new 3-methylflavones. *Indian Journal of Heterocyclic Chemistry*. 2010, 19: 237-244.
25. Jayashree BS, Alam A, Kumar V and Nayak Y. Synthesis of 3-methylflavones and their antioxidant and antibacterial activity. *Medicinal Chemistry Research*. 2012, 21:1991-1996. (IF: 1.61)
26. Joseph L and George M. Pharmacognostical profiling of *Geranium ocellatum* leaves. *International Journal of Medicinal and Aromatic Plants*. 2011, 1: 351-354.
27. Joseph L, George M, Agrawal S and Kumar V. Pharmacognostical and phytochemical studies on *Jasminum grandiflorum* leaves. *International Journal of Pharmaceutical Frontier Research*. 2011,1:80-92.
28. Kamaljeet, Tomar S, Thakur N. Antipyretic activity of whole aerial part from *Argyrea nervosa*. *International Journal of Pharmacy and Pharmaceutical Sciences*. 2012, 4:487-488.
29. Kaur L, Joseph L, George M. Phytochemical analysis of leaf extract of *Aesculus indica*. *International Journal of Pharmacy and Pharmaceutical Sciences*. 2011, 3:232-234.
30. Kumar A and Upadhyay N. Process validation: A critical tool in Quality Assurance. Pharma tutor, 2012.
31. Kumar D, Saini N, Jain N, Sareen R & Pandit V. Gold nanoparticles: an era in bionanotechnology. *Expert opinion drug delivery*. 2013, 10:397-409. (IF:2.9)
32. Kumar D, Saini N, Pandit V, Ali S. An Insight to Pullulan: A biopolymer in pharmaceutical approaches. *International Journal of Sciences: Basic and Applied Research*. 2012, 1:202-221.
33. Kumar M, Goyal R, Munshi S.K, Hayat M. Mukhtar, Goyal R. Protective effect of *Carum carvi* fruit against paracetamol and

- thioacetamide induced hepatic injury in rats. *Journal Ethnobiology Traditional Medicines Photon*. 2013, 118:355-365. (IF:3.7)
34. Kumar N, Nepali K, Sapra S, Reddy K, Kumar R, Suri OP, Dhar KL. Effect of nitrogen insertion on the antitussive properties of menthol and camphor. *Medicinal Chemistry Research*. 2012, 21:531-537. (IF: 1.61)
 35. Kumar S, Joseph L, George M, Kaur L, Abhi V. An overview- *Croton zambesicus* Muell. *International Journal of Pharmaceutical Research and Development*. 2011,3.
 36. Kumar S, Joseph L, George M, Kaur L, Bharti V. Skeletal muscle relaxant activity of methanolic extract of *Rumex nepalensis* in albino rats. *Journal of Chemical and Pharmaceutical Research*. 2011, 3:725-728.
 37. Kumar S, Joseph L, George M, Sharma A. A review on anticoagulant/antithrombotic activity of natural plants used in traditional medicine. *International Journal of Pharmaceutical Sciences Review and Research*. 2011, 8:70- 74.
 38. Kumar S, Sharma G, George M, Joseph L. Skeletal muscle relaxant activity of chloroform extract of *Phyllostachys bambusoides*. *International Journal of Pharmacy and Pharmaceutical Sciences*. 2012, 4:125-127.
 39. Kumar S, Sharma G, Sharma A, George M, Joseph L. Anticonvulsant activity of Chloroform extarct of *Phyllostachys bambusoides*. *International Journal of Pharmacy and Pharmaceutical Sciences*. 2011, 3:125-127.
 40. Kumar S, Sharma G, Sidiq T, Khajuria A, Jain M, Bhagwat D and Dhar KL. Immunomodulatory potential of bioactive fraction from the leaves of *Phyllostachys bambusoides* (Bamboo) in BALB/C Mice. *Experimental and Clinical Sciences Journal*. 2013, 13:137-150.
 41. Mallapur S, Panghal S, Mubeen G, Goli D & Shanboug R. A novel HPLC-PDA method development and validation for the simultaneous estimation of cefixme and ambroxol HCl in tablets. *International Journal of Pharmaceutical Sciences*. 2011, 3: 1279-1287.
 42. Md. Ali S, Choudhary V. Solubility enhancement methods with importance of hydrotropy. *Journal of drug delivery and therapeutics*. 2012, 2:96-101.
 43. Mehan S, Sharma G, Kumar S, George M, Joseph L, Arora R, Sharma D, Meena H, Vyas T. Evaluation of the Analgesic & Antipyretic Activity of the Aqueous and Chloroform Extract of the *Phyllostachys bambudoides*. *International Journal of Pharma Professional's Research*. 2011, 2:355- 358.

44. Nepali K, Bande MS, Sapra S, Garg A, Kumar S, Sharma P, Goyal R, Satti NK, Suri OM, Dhar KL. Antitussive effects of azepino [2, 1-b] quinazolones. *Medicinal Chemistry Research*. 2012, 21:1271-1277. **(IF: 1.61)**
45. Nepali K, Kadian K, Ojha R, Dhiman R, Garg A, Singh G, Budhiraja A, Bedi PM, Dhar KL. Effect of Ring A and Ring B Substitution on the cytotoxic potential of Pyrazole tethered Chalcones. *Medicinal Chemistry Research*. 2012, 21:2990-2997. **(IF: 1.61)**
46. Nepali K, Ojha R, Sharma S, Ojha A, PSM Bedi, Dhar KL. Tubulin inhibitors: A patent survey. *Recent Patents on Anticancer Drug Discovery*. 2013, 9:176-220. **(IF: 4.29)**
47. Nepali K, Ojha R, Singh A, Budhiraja A, Nepali K, Dhar KL. Design, synthesis and evaluation of arylidene pyrrolo and pyrido fused quinazolones as antimicrobial agents. *Letters in Drug Design & Discovery*. 2013, 10:522-528. **(IF: 0.77)**
48. Nepali K, Sharma S, Ojha R, Dhar KL. Vasicine and structurally related quinazolines. *Medicinal Chemistry Research*. 2013, 22:1-15. **(IF:1.61)**.
49. Ojha R, Nepali K, Goyal R, Dhar KL, Bhardwaj T. Synthesis, In Vitro hydrolysis, bioanalytical method development and pharmacokinetic study of an amide prodrug of Ibuprofen. *Current Pharmaceutical Analysis*, 2012, 8:261-271. **(IF:0.71)**
50. Patil S, Ojha R, Kaur G, Nepali K, Aggarwal S and Dhar KL. Estimation of Seasonal Variation of Two Major Pyrrolo [2, 1-b] Quinazoline Alkaloids of *Adhatoda vasica* by HPLC. *The Natural Products Journal*. 2013, 3:30-34.
51. Awasthi P, Gupta N, Sapra S, Dhar KL. Iridoids- A Review. *International Journal of Pharmaceutical Sciences Letters*. 2013,2:184-189.
52. Pundir S, Tomar S, Mishra S, Albert S, Jain M. Pharmacognostical standardisation and chromatographic evaluation of *Tecomella undulata* stem bark. *International Journal of Biology, Pharmacy and Allied Sciences*. 2015, 4 (MS/IJBPAS/2015/2685) **(IF: 0.8)**
53. Purohit S, Gupta S, Khanna A, Jain M. A review on draft guidance for establishing bioequivalence for orally administrated non absorbing antibiotics: Vancomycin Hydrochloride. *International Journal of Pharmaceutical Science and Research*. 2012, 15: 66-70.
54. Rana AS, Upadhyay NK, Sapra S, Sharma M. Validation and development of a RP-HPLC method for determination of glycoside (salicin) in an ayurvedic preparation. *The Pharmaceutical and Chemical Journal*. 2014, 1:1-5. **(IF:0.65)**

55. Rana S, Rana S, Arya A, Khah S, Goyal R. Post-surgical abdominal adhesions: A great challenge for future. *Journal of Pharmacy Research*. 2012, 5:3400-3405.
56. Rupesh AG, Suresh S and Pandit V. Multiparticulate formulation of Valdecoxib for the treatment of Rheumatoid arthritis. *Journal of applied Pharmaceutical Science*. 2012,2:217-222.
57. Saini N, Mathew G, Lincy J. Matrix Tablets: An effective way for oral controlled release drug delivery. *Iranian Journal of Pharmaceutical Sciences*. 2012, 8:165-170.
58. Saini N, Pandit V, Ali S. Formulation and evaluation of sustained release matrix tablets of cefuroxime Axetil. 2012, *LAP LAMBERT Academic Publishing*
59. Sapra S, Bhalla Y, Nanadani, Sharma S, Singh G, Nepali K, Budhiraja A, Dhar K L. Colchicine and its various physiochemical and biological aspects. *Medicinal Chemistry Research*. 2013, 22: 531-547. **(IF: 1.61)**
60. Sapra S, Bhalla Y, Nandani, Sharma S, Singh G, Nepali K, Budhiraja A, Dhar KL. Colchicine and its various physicochemical and biological aspects. *Medicinal Chemistry Research*. 2013, 22: 531-547. **(IF:1.61)**
61. Sareen R, Jain N, Dhar KL. An insight to colon targeted drug delivery system. *Drug Delivery Letters*. 2013, 3: 127-135.
62. Sareen R, Jain N, Dhar KL. Development of colon specific microspheres of flurbiprofen for inflammatory bowel disease. *Current Drug Delivery- Bentham Science*. 2013,10:564-671.
63. Sareen R, Jain N, Kumar D. An insight to osmotic drug delivery. *Current drug delivery- Bentham Science*. 2012, 9:285-296.
64. Sareen R, Jain N, Pandit V. Curcumin: A boon to colonic diseases. *Current Drug Target*. 2013,14:1210-1218.
65. Sareen S, Mathew G, Joseph L. Improvement in solubility of poor water-soluble drugs by solid dispersion. *Pharmaceutical Investigation*. 2012, 2: 12-17.
66. Sharma A, Jain N, Sareen R. Nanocarriers for diagnosis and targeting of breast cancer. *Biomedical Research International*. 2013,1: 1-10
67. Sharma A, Upadhyay N. Study of various solvents for pholcodine determination using UV spectrophotometer. *International Research Journal of Pharmacy*. 2013, 4:122-126.
68. Sharma G, Kumar S, Bhagwat DP. Prion Diseases “Combat of genomes & contest for the survival of fittest in microbial world”. *Drug Invention Today*. 2012, 4:381-386.
69. Sharma S, Puri S, Jamwal A, Bhattacharya S, Dhindsa N and Thakur K. Effect of Salt Stress on Seedling growth and Survival of *Oenothera*

- biennis* L. *International Research Journal of Environment Sciences*. 2014, 3:370-374.
70. Sharma S, Thakur V, Ojha R, Budhiraja A, Nepali K, Bedi PMS. Aza analogs of flavones as potential antimicrobial agents. *Letters in Drug Design & Discovery*. 2013, 10:327-334.
 71. Sharma T, Joseph L, Khah S. Ethanobotanical claims and pharmacological activities of *Cuscuta reflexa* Roxb- A Review. *Research Gate: Pharmaceutical Sciences*. 2012, 1:15-18.
 72. Sharma V, Dhar KL, Sharma P, Sharma P. Indian Herbal Medicine- A Natural Cure to Asthma. *International Journal of Pharmacognosy and Phytochemical Research*. 2014, 5:302-310. **(IF:1.34)**
 73. Sharma V, Goyal R, Singh G, Sharma PL. Possible combinatorial effect of silymarin with hepatoprotective plants in amelioration of hepatic insufficiencies. *American Journal of Phytomedicine and Clinical Therapeutics*. 2013, 2:107-116.
 74. Sharma V, Sharma HV, Mehta D, Chhabra B, Thakur D, Sourirajan A, and Dev K. "Comparative Analysis of Antibacterial and Antifungal Properties of Traditional Medicinal Plants of Shimla and Solan, Himachal Pradesh. *International Journal of Pharmacognosy and Phytochemical Research*. 2014, 6:18-26. **(IF:1.34)**
 75. Tomar SK, Sharma G, Thakur N, Kamaljeet. Immunostimulatory potential of an alcoholic extract (ACP) from *Carica papaya* against SRBC in Balb/C mice. *International Journal of Phytopharmacology*. 2012, 3:194-197.
 76. Gupta P, Goyal R, Chauhan Y, Sharma PL, Possible modulation of FAS and PTP-1B signaling in Ameliorative potential of *Bombax ceiba* against High fat diet induced obesity, *BMC Complementary and Alternative Medicine*, 2013, 13: 281 (doi:10.1186/1472-6882-13-281) **(I.F. 1.8)**.
 77. Kapileswar S, Garg Sk, Kumar R, Purohit P, Meena VS, Goyal R, Banerjee UC, and Chakraborti AK, 2-(2-Arylphenyl)benzoxazole As a Novel Anti-Inflammatory Scaffold: Synthesis and Biological Evaluation, *ACS Med. Chem. Lett.*, 2014 (DOI: 10.1021/ml400500e) **(I.F. 3.7)**.
 78. Sharma A, Goyal R, Schizophrenia: A Pathological and Therapeutic Review, *Journal of Harmonized Research in Pharmacy*, 2(3), 2013, 207-214.
 79. Yamini Chauhan, Rohit Goyal, Shaila Khah, Pyare Lal Sharma, Mild alcohol intake exacerbates metabolic syndrome in rodents: A putative role of GSK-3 β , *Journal of Receptors and Signal Transduction* (Article in Press) **(I.F. 1.6)**.

23. Details of patents and income generated:

Income Generated: Nil

Patent filed:

S.No.	Title of Patent	Inventors	Status
1.	Anti-Cancer activity (Breast Cell Cancer) of novel isoflavone from <i>Iris kashimiriana</i> grown in Himachal Pradesh	Dr. Afroze Alam and Dr. K.L. Dhar	Filed on 27.06.2015 Filing No. is awaited.

24. Areas of consultancy and income generated:

The School is providing consultancy in following areas to industry:

Table PH12: Consultancy project

S. No.	Name of PI	Title/Area	Amount (₹)	Funding Agency
1.	Prof. Neeraj Mahindroo & Dr. Poonam Negi	Trouble –shooting and problem-solving for marketed formulation.	30,000.00	Meridian Medicare Pvt. Ltd, Solan, H.P.
2.	Prof. Neeraj Mahindroo & Dr. Poonam Negi	Formulation development for vitamin preparations	50,000.00	Meridian Medicare Ltd., Solan, H.P.

Faculty members from the School of Pharmaceutical Sciences also provide consultancy as expert speakers. Following is the list of expert lectures delivered by faculty from School of Pharmaceutical Sciences:

Table PH13: Consultancy as expert speaker

S. No.	Faculty	Lecture Title	Institute/organization
1.	Prof. Neeraj Mahindroo	Good Storage Practices for Pharmaceutics	Continuing Pharmacy Education Program for Pharmacists, Nahan, H.P, September 14 th , 2014.
2.	Prof. Neeraj Mahindroo	Good Storage Practices for Pharmaceutics	Continuing Pharmacy Education Program for Pharmacists, Una, H.P, August 23 rd , 2014.
3.	Prof. Neeraj Mahindroo	New Molecules in Market	Refresher courses for Pharmacist, Department of Health & Family Welfare, State Health & Family Welfare Training Institute, Shimla, H.P, July 13 th , 2013
4.	Prof. Neeraj Mahindroo	Pharmacists Role in Counselling Patients regarding Medications	Refresher courses for Pharmacist, Department of Health & Family Welfare, State Health & Family Welfare Training Institute, Shimla, H.P, July 13 th , 2013

25. Faculty selected nationally / internationally to visit other laboratories / institutions / industries in India and abroad

The faculty members have been selected to visit other labs and institutes to attend various training programs. Following is the list of such programs attended by the faculty:

- Dr. Rohit Goyal attended training program on “Use of Animals for Experiments” organized by CPCSEA at National Institute of Animal Welfare, Ballabgarh, Haryana from 18-22 May 2015
- Ms. Shaila Khah visited for Experimental work on Gene Expression to Department of Pharmacology and Toxicology, NIPER, Mohali, Punjab From 16-18 May, 2015
- Dr. Rohit Goyal attended one week training program at Panjab University organized by International Brain Research Organization (IBRO), in Nov 2014.
- Mr. Gaurav Sharma attended 10 days training at NIMR, Dwarka, New Delhi.
- Dr. Sameer Sapra, Mr. Navneet Kumar Upadhyay participated in Agilent technologies sponsored Workshop on “Agilent Academy’s HPLC Method Optimization & Development Training Program” in Chandigarh, on 25th March, 2014.
- Mr. Navneet Kumar Upadhyay participated in Agilent technologies sponsored Workshop on “Agilent Academy’s HPLC Method Optimization & Development Training Program” in Chandigarh on 25th March, 2014.
- Mr. Vikas Sharma participated in “Continuing Pharmacy Education Program” conducted by Pharmacy Council of Himachal Pradesh at Jaypee University, Solan in March 2012

26. Faculty serving in

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

Table PH14: List of faculty members serving as experts in committees, resource persons, journal reviewers

Name of faculty	Organization
Prof. Neeraj Mahindroo	Member, ICMR Expert Group for Medicinal Plants Monographs
	Resource Person, Continuing Education Program, H.P State Pharmacy Council
	Resource Person in UGC Networking Resource Centre, 5 th - 10 th August 2013, UIPS, Panjab University, Chandigarh
	Resource Person, Continuing Education Program, Directorate of Health and family welfare
	Reviewer for J Med Chem., Bioorg. Med Chem., Bioorg. Med. Chem. Letter, Med Chem Res, Biorg. Chem.
Dr. Rohit Goyal	Reviewer, BMC Complementary and Alternative Medicine
	Reviewer, Pharmacognosy Magazine, Medknow Publications
	Reviewer, Journal of Diabetes & Metabolic Disorders
Dr. Deepak Nandkishore Kapoor	Reviewer, International Journal of Nanomedicine, Dove Press

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

Faculty members from the School of Pharmaceutical Sciences have actively participated and presented their research work in various refresher courses, conferences, workshops, orientation and training programs organized by different national and international organizations. Following is the list of different programs attended by the faculty:

Faculty Development Programs/ Refresher courses/ Workshops/ conferences/ orientation programs/ training programs:

- Dr. Sameer Sapra and Mr. Vikas Sharma and Tanurajveer Kaur attended Faculty Development Program organized by Shoolini University in collaboration with Business Training Ideas from 16-17 June 2015.
- Dr. Rohit Goyal, Dr. Deepak Nandkishore Kapoor, Dr. Poonam Negi, Dr. Sameer Sapra, Ms. Shaila Khah, Mr. Navneet Upadhyay, Mr. Vikas Sharma, Ms. Tanurajvir Kaur, Mr. Gaurav Sharma, Ms. Swati Pundhir attended a Workshop on Advancements in Analytical Techniques

organized by Waters India Ltd. held at Shoolini University, Dist. Solan on 25th March, 2015.

- Dr. Deepak Nandkishore Kapoor, Dr. Poonam Negi, Ms. Tanurajvir Kaur were training expert for “Pharmaceutical evaluation of finished herbal products” in ICMR sponsored National Workshop-cum-Training Program on “Standardization of Medicinal Plants and their Products” held at Shoolini University on 22nd-24th March, 2015.
- Dr. Rohit Goyal, Ms. Shaila Khah were training expert for “Safety evaluation of herbal drugs” in ICMR sponsored National Workshop-cum-Training Program on “Standardization of Medicinal Plants and their Products” held at Shoolini University on 22nd-24th March, 2015.
- Dr. Sameer Sapra, Dr. Afroze Alam were training expert for “Isolation of marker and identification by spectroscopic techniques” in ICMR sponsored National Workshop-cum-Training Program on “Standardization of Medicinal Plants and their Products” held at Shoolini University on 22nd-24th March, 2015.
- Dr. Sameer Sapra, Mr. Navneet Kumar Upadhyay were training expert for “Demonstration of extraction methods such as microwave extraction, soxhlet percolation, maceration etc.” in ICMR sponsored National Workshop-cum-Training Program on “Standardization of Medicinal Plants and their Products” held at Shoolini University on 22nd-24th March, 2015.
- Mr. Vikas Sharma, Ms. Swati Pundhir were training expert for “Identification and pharmacognostic characterization of medicinal products” in ICMR sponsored National Workshop-cum-Training Program on “Standardization of Medicinal Plants and their Products” held at Shoolini University on 22nd-24th March, 2015.
- Mr. Gaurav Sharma participated in ICMR sponsored National Workshop-cum-Training Program on “Standardization of Medicinal Plants and their Products” held at Shoolini University on 22nd-24th March, 2015.
- Prof. Neeraj Mahindroo was invited as a guest speaker to deliver a talk on Small Molecule Modulators of Hedgehog-Gli Pathway at International Symposium on Recent advances in Medicinal Chemistry, NIPER, Mohali, Punjab, in September 10, 2014.
- Ms. Swati Pundhir attended workshop on “Emerging trends in Pharmacological education and research” at Shoolini University held on 3rd May, 2014.

- Dr. Sameer Sapra participated in one day national seminar on “Research in Pharmaceutical and Biomedical Sciences: Ideation to Translation” on 23rd February at Govt. College of Pharmacy, Aurangabad.
- Dr. Rohit Goyal, Dr. Sameer Sapra, Mr. Navneet Kumar Upadhyay, Ms. Shaila Khah, Mr. Vikas Sharma participated in One day workshop on “Recent trends in Pharmacological Education & Research” organized at School of Pharmaceutical Sciences, Shoolini University in association with AD Instruments, USA on 3rd May, 2014.
- Mr. Navneet Kumar Upadhyay participated in Shoolini University Organized a workshop on “Emerging trends in Pharmacological education and research” as an organizing committee member, 3rd May, 2014 Solan HP.
- Mr. Vikas Sharma participated in Workshop on Inspirational leadership program organized Training and Development, Shoolini University on March 13, 2014.
- Dr. Nitin Jain and Dr. Rashmi Sarin attended conference on Innovation in Engineering, Pharmaceutical, Legal and Management Sciences (IEPLMS 2014)” organized by Bahra University, Shimla, 2014.
- Dr. Sameer Sapra and Mr. Navneet Kumar Upadhyay participated in Lecture series organized by Shoolini University in association with Biospectrum on “Exploring Entrepreneurship & Corporate Opportunities” at Shoolini University, 27 February 2013.
- Mr. Vikas Sharma participated in Optimization of sampling errors workshop organized by Faculty of Management Sciences and Liberal arts, Shoolini University on 2-3 December, 2013.
- Dr. Sameer Sapra, Dr. Rashmi Sarin, Mr. Navneet Kumar Upadhyay, Mr. Vikas Sharma, Ms. Swati Pundhir, Ms. Shaila Khah participated in national Conference on theme “Research Trends in Future Drug Development: Exploration of Medicinal and Aromatic Flora” on 20th & 21st June, 2013 sponsored by Indian Council of Medical Research (ICMR) in collaboration with Society of Pharmaceutical Education and Research (SPER), 20-21 June, 2013 at School of Pharmaceutical Sciences, Shoolini University, Solan
- Ms. Shaila Khah participated in Optimization of sampling errors workshop organized by Faculty of Management Sciences and Liberal arts, Shoolini University on 2-3 December, 2013.

- Mr. Navneet Kumar Upadhyay participate in Shoolini University Organized an interface on “Pharmaceutical Research Education & Industrial Confluence - Bridging the Skill Gap” as an organizing committee member, 10th March, 2012, Baddi (HP).
- Mr. Vikas Sharma participated in seminar on Advancing Separation and Detection held on 21st September, 2012 organized by Agilent technologies.
- Mr. Navneet Kumar Upadhyay, Mr. Vikas Sharma, Ms. Swati Pundhir, Ms. Shaila Khah participate in DST sponsored National Seminar on “Importance of Cell Lines in Pharmaceutical Research in India” as an organizing committee member in Shoolini University, Solan (HP), 14th-15th Nov. 2011 Solan, HP.

Poster presentations:

- Ms. Shaila Khah presented poster in International Conference on Recent Advances in Cardiovascular Sciences, 10-11th March 2015 at Amity University, Noida.
- Tanurajvir Kaur, Charul Rathore, Poonam Negi, Prof. Neeraj Mahindroo. Novel carrier based herbal drug delivery systems. International Conference on “Advances in Pharmaceutical Nanotechnology and Nanomedicine” at I.S.F. College of Pharmacy, Moga on 6-8th February, 2015.
- Charul Rathore, Tanurajvir Kaur, Shaila Khah, Poonam Negi, Prof. Neeraj Mahindroo. Burn-Induced wound healing and anti-cancer evaluation of Butea frondosa. “Advances in Pharmaceutical Nanotechnology and Nanomedicine” at I.S.F. College of Pharmacy, Moga on 6-8th February, 2015.
- Tanurajvir Kaur, Dr. Poonam Negi, Prof. Neeraj Mahindroo. Phytosome based drug delivery system for herbal medicine. “International Conference on “Molecular Pharmacology, Drug Discovery and Nanopharmaceuticals” (MPDDNP-2015) at Chitkara College of Pharmacy, Chitkara University, Rajpura on 27th and 28th March, 2015.
- Tanurajvir Kaur, Dr. Poonam Negi, Prof. Neeraj Mahindroo. Liposomal based drug delivery system for herbal medicine. “National Conference on Advancements, Opportunities and Future Vision of Indian Scenario of Pharmaceutical Education& Research” at Rayat- Bahra Institute of Pharmacy, Hoshiarpur on 3rd and 4th April, 2015.

- Mr. Navneet Kumar Upadhyay participated as delegate for presenting scientific paper in International Conference on Advances in Pharmaceutical Nanotechnology and Nanomedicine (ICAPNN-2015) Organized by: ISF college of Pharmacy, Moga (Punjab) with DST on 6-7th February, 2015.
- Ms. Swati Pundhir presented poster on “Antioxidant, anti-Inflammatory and analgesic activity of bioactive fraction of *Myrica esculenta* Buch.-Ham Along with its Pharmacognostic and Chromatographic evaluation” in International conference on “Advances in Pharmaceutical Nanotechnology and Nanomedicine (ICAPNN-2015)” at ISF College of Pharmacy, Moga, Punjab (6th & 7th Feb 2015).
- Dr. Sameer Sapra presented a poster in International conference on “Overcoming the bottle necks in drug discovery” organized by Daichi, Gurgaon, 20-21 March 2014.
- Dr. Sameer Sapra presented a poster in national conference on “Advances in Biotechnology in crop Management” on July 12, 2014 organized by Eternal University, Baru Sahib
- Mr. Navneet Kumar Upadhyay participated as delegate for presenting paper in one day National Conference on “Innovation in Engineering, Pharmaceutical, Legal and Management sciences” sponsored by Bahra University, Shimla Hills Held on 30th May 2014.
- Ms. Swati Pundhir presented poster on “Pharmacognostical and Pharmacological investigation of leaves of *Myrica esculenta*” in “National Conference on Innovation in Engineering, Pharmaceutical, Legal and Management sciences” at Bahara University, Shimla, held on 30th May 2014.
- Ms. Swati Pundhir presented poster on “Pharmacognostical and Pharmacological investigation of leaves of *Roylea cinerea*” in “International Conference on Drug resistance, development, Pharmaceutical technology and outcomes (DRDPTO-2014)” at Chitkara University, Punjab held on 11-12 April, 2014.
- Gaurav Sharma , S.K. Tomar, Zabeer Ahmed, K.L. Dhar, Evaluation of Anti-Adipogenecity & Anti-Diabetic Activity of hydro-alcoholic Extract of *Prunus persica*. Dubai International pharmaceutical and Technologies Conference and Exhibition (DUPHAT), to be held on 10-12 March- 2013, Dubai, UAE.
- Mr. Navneet Kumar Upadhyay participated as delegate for presenting scientific poster in one day National seminar on “Research in

Pharmaceutical and Biomedical Sciences: Ideation to Translation” sponsored by Asian biomedical and pharmaceutical research Association Held on 23rd February 2013 at Govt. College of Pharmacy, Aurangabad.

- Mr. Navneet Kumar Upadhyay participated as delegate for presenting scientific poster in 1st International conference on “Recent Advance in Chemical Science” Sponsored by: Director General, higher Education, Haryana, DST, New Delhi, CSIR, New Delhi DST, Haryana and Panipat Refinery. Organized by: Department of chemistry, Arya P. G. College, Panipat, Haryana, India from February 24-26, 2013.
- Mr. Navneet Kumar Upadhyay participated as delegate for presenting scientific poster in International conference “APPADDCD-2013” on “Advance in Pharmacological & Pharmaceutical approaches to drug Discovery & Clinical Development” (APPADDCD-2013) Organized by: Chitkara college of Pharmacy, Chitkara University on 15th – 16th March, 2013.
- Mr. Navneet Kumar Upadhyay participated as delegate for presenting scientific poster in International Conference on Interdisciplinary Areas with Chemical Sciences (ICIACS 2013) Organized by: Panjab University, Chandigarh in association with Institute of Nano science and technology, Mohali on 30th October – 1st November, 2013.
- Sharma Gaurav, Sunil Kumar, Zabeer Ahmed, Rohit Goyal, Deepak Bhagwat and K.L Dhar. Evaluation of Anti-Adipogenecity & Anti-Diabetic Activity of Chloroform Extract of Prunus persica. 4th International Conference on Cancer, to be held on 19-22 Oct- 2013, Mumbai, India.
- Mr. Navneet Kumar Upadhyay participate as delegate for presenting scientific paper in IPGA National Convention-2012 on “The Future of Pharmacist: A Health Care Professional” Organized by: Indian pharmacy graduates’ Association, Krukshetra Chapter in Collaboration with Institute of pharmaceutical sciences, Kurukshetra university, Kurukshetra – 136119, November 17-18, 2012.
- Mr. Vikas Sharma presented poster and participated in IPGA National Convention-2012 on “ The Future of Pharmacist: A Health care professional” held on 17th -18th Nov., 2012 at Kurukshetra University, Kurukshetra
- Mr. Vikas Sharma presented paper in National Seminar on Advances in Environmental Sciences organized by titled Synergistic activity of

hepatoprotective plants with silymarin organized by Him Science Congress Association held on August 24, 2012 at Shoolini University.

- Mr. Vikas Sharma presented poster and participated in National Seminar on Advances in Drug Design, delivery and Pharmaceutical Technology held at Chitkara University sponsored by IPGA on May 4-5, 2012.
- Mr. Vikas Sharma presented poster and participated in AICTE sponsored “National Seminar on Future Trends in Upcoming Pharma Sector” on 17th March 2012.
- Sharma Gaurav, Sunil Kumar, Zabeer Ahmed, Rohit Goyal, Deepak Bhagwat and K.L Dhar. Evaluation of Anti-Adipogenecity & Anti-Diabetic Activity of Prunus persica. IPSCON, Nagpur Jan 5-7, 2012.
- Sharma Gaurav, Tomar K Sunil, Sharma Abhishika, George Mathew and Joseph Lincy. Evaluation of antipyretic and analgesic activity of chloroform and aqueous extract of Phyllostachys bambusoides; National Seminar on Importance of Cell-Lines in Pharmaceutical Research in India (ICLPRI 2011) Shoolini University, Solan (November 14-15, 2011).
- Gaurav Sharma, Sunil Kumar, Abhishikha Sharma, Mathew George and Lincy Joseph. Evaluation of Pharmacological Activity of Chloroform Extract of Phyllostachys bambusoides; National Seminar on Importance of Cell-Lines in Pharmaceutical Research in India (ICLPRI 2011) Shoolini University, Solan, November 14-15, 2011.

28. Student projects

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

Ph.D. 100%

M. Pharmacy 100% (2011-13, 2012-14, 2013-15), 25% (2010-2012 Batch)

B. Pharmacy 100%

***Percentage of students doing projects in collaboration with other universities / industry / institute:** Not Applicable

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

Table PH15: List of recognitions/ awards received by faculty

S. No.	Faculty Name	Recognition /Award	Conference	Year
1	Dr. Rohit Goyal	Travel award from DST, New Delhi	International Conference of FIP Centennial Congress of Pharmacy and Pharmaceutical Sciences at Amsterdam	2012
2	Dr Rohit Goyal	Travel award from Sir Ratan Tata Trust, Mumbai	International Conference on Pharmacy and Pharmacology, London, UK	2014
3	Dr. Shoumyo Bhattacharya	1 st prize in poster presentation	AICTE sponsored National seminar on Future trends in Upcoming Pharma Sector at Himalayan Institute of Pharmacy, Kala Amb, HP	2012
4	Mr. Vikas Sharma	3 rd prize in poster presentation	AICTE sponsored National seminar on Future trends in Upcoming Pharma Sector at Himalayan Institute of Pharmacy, Kala Amb, HP	2012
5	Mr. Gaurav Sharma	Travel award from CSIR, New Delhi	14 th Tetrahedron Symposium, Vienna, Austria	2013
6	Mr. Gaurav Sharma	Travel award from ICMR New Delhi	Dubai International Pharmaceutical Technologies, Conference & Exhibition DUPHAT-2014, Dubai, UAE	2014
7	Ms. Shaila Khah	Best Paper Award	IPGA sponsored National Seminar on, “Role of community pharmacist in handling of antibiotics”, Kurukshetra	2014

Table PH16: List of recognitions/ awards received by doctoral fellows

S. No.	Name	Recognition/Award	Year
1	Ms. Megha Sharma	INSPIRE Fellowship	2012
2	Ms. Kamna Sharma	INSPIRE Fellowship	2013
3	Mr. Sunil Kumar Tomar	INSPIRE Fellowship	2013

Table PH17: List of recognitions/ awards received by students

S.No.	Student Name	Recognition /Award	Conference	Year
1	Mr. Sunil Tomar	Travel award from CSIR, New Delhi	14 th Tetrahedron Symposium, Vienna, Austria	2013
2	Mr. Varun Gupta	1 st prize in oral presentation	45th Annual Conference of Indian Pharmacological Society on Navigating Pharmacology towards Safe and effective Therapy organized by KB College of Pharmacy, Nagpur	2013
3	Mr. Varun Gupta	Best oral presenter award	North Zone Conference of Indian Pharmacological Society on New Horizons in Pharmacy & Pharmacology organized at GLA University, Mathura	2014
4	Ms. Geetanjali Jain	1 st prize for poster presentation	International Conference on Drug Resistance, Development, Pharmaceutical Technology And Outcomes at Chitkara University, Punjab	2014
5	Mr. Sunil Tomar	Travel award from ICMR, New Delhi	Dubai International Pharmaceutical Technologies, Conference & Exhibition DUPHAT-2014, Dubai, UAE	2014
6	Ms. Violina Kakoty	2 nd prize for poster presentation	International Conference on Molecular Pharmacology, Drug Discovery and Nano Pharmaceuticals - 2015 at Chitkara University, Punjab	2015

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

Table PH18: List of seminars/ conference/ workshop/ training programs organized by School of Pharmaceutical Sciences

Name	Title / Theme	Source of Funding	Date
One day workshop	Catch them young program	Waters India Pvt. Ltd.	March 25, 2015
National Workshop cum Training Program	Standardization of Medicinal plants and their products	Indian Council for Medical Research (ICMR), New Delhi. Fully funded program including stay, travel and registration	March 22-24, 2015
Workshop	Emerging Trends in Pharmacological education and research	AD instruments and Shoolini University, Solan	May 3, 2014
Conference	Research Trends in Future Drug Development: Exploration of Medicinal and Aromatic Plants	Indian Council for Medical Research (ICMR) & Society for Pharmaceutical Education and Research (SPER)	June 20-21, 2013
Workshop	Pharmaceutical Research, Education & Industrial Confluence “Bridging the Skill Gap”	Shoolini University, Solan	March 10, 2012
National Seminar	Importance of Cell Lines in Pharmaceutical Research in India	Department of Science and Technology (DST)	Nov. 14-15, 2011
National Conference	Drug Discovery, Development & Clinical trials: Current status and the way forward	Pharmanext	June 26-27, 2010

31. Code of ethics for research followed by the departments:

The School of Pharmaceutical Sciences follows ICMR code of ethics for Life Sciences.

32. Student profile program-wise:

Table PH19: Program-wise pass percentage of B. Pharmacy, M. Pharmacy and Ph.D. students

Student profile program-wise:

Table PH20: Program-wise pass percentage of B. Pharmacy, M. Pharmacy and Ph.D. students

Name of the Program	Applications received	Selected		Pass Percentage	
B. Pharmacy					
		Male	Female	Male	Female
B. Pharmacy (2010-14)	41	13	08	100	100
B. Pharmacy (2011-15)	57	37	12	59	94
B. Pharmacy (2012-16)	77	29	18	-	-
B. Pharmacy (2013-17)	60	27	21	-	-
B. Pharmacy (2014-18)	61	39	21	-	-
B. Pharmacy (Lat.)					
B. Pharmacy (L) (2010-14)	2	2	0	100	-
B. Pharmacy (L) (2011-15)	4	4	0	100	-
B. Pharmacy (L) (2012-16)	1	0	1	-	-
B. Pharmacy (L) (2013-17)	3	2	1	-	-
B. Pharmacy (L) (2014-18)	0	0	0	-	-
M. Pharmacy					
M. Pharmacy (2009-11)	8	6	2	100	100
M. Pharmacy (2010-12)	140	47	37	100	100
M. Pharmacy (2011-13)	52	24	26	100	100
M. Pharmacy (2012-14)	21	5	14	100	100
M. Pharmacy (2013-15)	14	3	7	-	-
M. Pharmacy (2014-16)	24	7	12	-	-
Ph.D.					
Ph.D. (2009)	6	4	0	50	-
Ph.D. (2010)	19	3	1	67	100
Ph.D. (2012)	13	3	4	-	-
Ph.D. (2013)	-	-	-	-	-
Ph.D. (2014)	10	4	3	-	-

33. Diversity of students:

Table PH21: Program-wise data for diversity of students

Name of the Program (refer to question no. 4)	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
B.Pharm(2010-14)	None	100%	None	None
B. Pharm (2011-15)	None	94%	6%	None
B. Pharm (2012-15)	None	92%	8%	None
B. Pharm (2013-17)	None	85%	15%	None
B. Pharm (2014-18)	None	97%	3%	None
M. Pharm (2009-11)	None	88%	12%	None
M. Pharm (2010-12)	None	55%	45%	None
M. Pharm (2011-13)	None	80%	20%	None
M. Pharm (2012-14)	None	90%	10%	None
M. Pharm (2013-15)	None	100%	None	None
M. Pharm (2014-16)	26%	48%	26%	None
Ph.D. (2009)	None	None	100%	None
Ph.D. (2010)	None	None	100%	None
Ph.D. (2012)	62%	None	38%	None
Ph.D. (2014)	42%	44%	14%	None
Ph.D. (2015)	-	-	-	25%

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

GPAT Exam: GPAT is the benchmark exam conducted by AICTE for B. Pharmacy students interested in pursuing M. Pharmacy. Students who qualify GPAT are eligible for stipend from AICTE. Following is the list of students of School of Pharmaceutical Sciences who qualified GPAT exam.

Number of students who qualified GPAT Exam: 15

Table PH22: List of GPAT qualified students

S. No.	Name of the students	Year
1	Md. Afroze Alam	2012
2	Vasudha Abhi	2012
3	Varun Gupta	2012
4	Arun Sharma	2012
5	Deepika	2012
6	Diksha Sharma	2013
7	Sunil Kumar	2013
8	Varun Gupta	2013
9	Poonam Negi	2014
10	Abhishek Naag	2014
11	Gaurav Paudwal	2014
12	Vikas Sharma	2014
13	Sajid Ali	2014
14	Abhishek Sharma	2015
15	Sitanshu Chauhan	2015
16	Poonam Negi	2015

Pharmacist Exam Qualified:**Table PH23: List of students who qualified pharmacist exam**

S. No.	Name of the students	Year
1	Shikha Kalia	2015
2	Hemraj	2015

35. Student progression**Table PH24: Data for student progression within university**

Student progression	Percentage against enrolled
UG to PG	10%
PG to M.Phil.	NA
PG to Ph.D.	5%
Ph.D. to Post-Doctoral	None
Employed	
• Campus selection	77 %
• Other than campus recruitment	23%
Entrepreneurs	Nil

36. Diversity of staff

Table PH25: Diversity of staff

Percentage of faculty who are graduates	
of the same university	18%
from other universities within the State	None
from universities from other States	82%
from universities outside the country	None

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

Following are the faculty members who were awarded Ph.D. degree during the assessment period:

Table PH26: List of faculty members awarded Ph.D. degree during assessment period

S. No.	Name of Student	Courses	Year
1	Dr. Poonam Negi	Ph.D.	2015
2	Dr. Afroze Alam	Ph.D.	2014
3	Dr. Deepak Nandkishore Kapoor	Ph.D.	2012
4	Dr. Sameer Sapra	Ph.D.	2012
5	Dr. Rohit Goyal	Ph.D.	2011
6	Dr. Parveen Kumar	Ph.D.	2014

38. Present details of departmental infrastructural facilities with regard to

a) Library:

The university works on Central Library model. However, the School of Pharmaceutical Sciences maintains a small library with a collection of only important and frequently referenced books. Online Library services are also available for the faculty and students of science stream including Pharmaceutical Sciences as detailed below:

- Total Book Volumes available in Central Library : 9982
- International & National Journals : 95

b) Internet facilities for staff and students: Yes

c) Total number of class rooms: 05

d) Class rooms with ICT facility: 05

e) Student's laboratories: 08

Table PH27: List of student's laboratories

S.No.	Name of Lab	Description
1.	Pharmacology-I	As per PCI/AICTE requirements
2.	Pharmacology-II	As per PCI/AICTE requirements
3.	Pharmacognosy-I	As per PCI/AICTE requirements
7.	Pharmaceutical Chemistry-I	As per PCI/AICTE requirements
4.	Pharmaceutical Chemistry-II	As per PCI/AICTE requirements
6.	Pharmaceutics	As per PCI/AICTE requirements
7.	Machine Room	Rotary tablet compression machine, dissolution apparatus, disintegration test apparatus, tube filling machine, bottle sealing machine, friability test apparatus, powder blender, bulk density apparatus, ball mill, sieve shaker, capsule filling machine
8.	Computer Lab	For Pharmacy Students/Literature search

f) Research laboratories: 5**Table PH28: List of research laboratories**

S. No.	Name of Lab	Description of research work
1.	Pharmacology PG lab	Novel target sites for disorders like neurodegeneration, osteoporosis and asthma
2.	Pharmacology Research Lab	Pharmacological potential and evaluation of natural entities for various diseases
3.	Pharmaceutical Chemistry PG lab	Design and synthesis of nitrogen heterocycles for anticancer, anti-inflammatory and anti-microbial activity
4.	Pharmaceutics PG lab	Formulation development of conventional dosage forms, sustained release and topical formulations
5.	Pharmaceutics Research Lab	Development of novel drug delivery systems such as nanoparticles, lipid based vesicular systems, nanoemulsions for natural products and synthetic drugs

g) Research facilities: 2

Table PH29: List of research facilities

S. No.	Name of Facility	Description
1.	Central Instrumentation Facility	HPLC, FTIR, GC, UV spectrophotometer, Flame Photometer, Lyophilizer, refrigerated centrifuge, trinocular microscope
2.	Animal House	As per CPCSEA requirements

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

a) Doctoral students from the host institution/university

Table PH30: List of doctoral students from Shoolini University

S. No.	Name	Registration number	Research Area	Name of Guide
1	Megha Sharma	12PH.D.07	a) Comparative degradation studies of digoxin and its acetate b) Development and validation of RP-HPLC stability indicating assay method for TAQZ, a novel bronchodilator	Prof. Neeraj Mahindroo
2	Swati Pundir	12PH.D.12	Assessment of antiprotozoal activity of <i>Roylea cinerea</i> (leaf) and <i>Myrica esculenta</i> (Bark)	Prof. Neeraj Mahindroo
3	Kamna Sharma	12PH.D.05	a) Synthesis and Pharmacological evaluation of nitrogen heterocycles with special emphasis on Quinolone analogues b) Isolation and Characterisation of the constituents of <i>Nicandra physalodes</i>	Dr. Sameer Sapra
4	Sunil Tomar	12PH.D.11	Immunomodulatory and anticancer potential of phytoconstituents from Solanaceae family	Prof. Neeraj Mahindroo
5	Gaurav Sharma	12PH.D.03	Investigation of selected North- Western Himalyan plants for Antimalarial activity.	Prof. Neeraj Mahindroo
6	Ashish Sharma	14PH.D.06	Investigation of novel pharmacological interventions underlying the pathogenesis of Alzheimer's disease	Dr. Rohit Goyal
7	Aditya Shiven	14PH.D.05	Development of novel lipid based vesicular drug delivery system of Karanjin for the treatment of skin disorders	Dr. Deepak N. Kapoor
8	Charul Rathore	14PH.D.04	Development, Optimization and evaluation of thymoquinone loaded nanocarriers formulations	Dr. Poonam Negi

c) Doctoral students from other institutions/universities:

Table PH31: List of doctoral students from other institutes/ universities

S. No	Names	Registration No.	Research Areas	Guides
1	Nitin Bharti	PH.D.-09-D-(PCT)-02	A study of targeted pulmonary drug delivery system containing nanoparticles	Dr. Abhishek Buddhiraja
2	Athar Javed	PH.D.-09-D-(PCT)-01	Synthesis, modification and biological screening pyridazine analogue	Dr. K.L. Dhar
3	Shoumyo Bhattacharya	PH.D.-09-D-(PCT)-03	Studies on anti-osteoporotic activity on plants <i>Acampe praemorsa</i> , <i>Lepidium sativum</i> and <i>morinda citrifolia</i>	Dr. K.L. Dhar
4	Afroze Alam	PH.D.-09-D-(PCT)-05	Synthesis and <i>aromatase</i> inhibitory activity of substituted flavones	Dr. K.L. Dhar
5	Nitin Jain	PH- 10(11)-D-02	Osmotic controlled release oral formulation of nutraceuticals with enhanced solubility	Dr. K.L. Dhar
6	Rashmi Jain	PH- 10(11)-D-03	Development of oral colon targeted drug delivery systems for treatment of inflammatory bowel disease: Characterization and evaluation	Dr. K.L. Dhar
7	Vikas Sharma	PH- 10(11)-D-05	Pharmacognostical standardization and pharmacological evaluation of active principles from Anti- asthmatic plants	Dr. Rohit Goyal
8	Sajid Ali	PH- 10(11)-D-04	Formulation and evaluation of multiparticulate system for effective treatment of <i>Helicobacter pylori</i> infection	Dr. K.L. Dhar
9	Shaila Khah	12PH.D.10	Investigation of bioactive leads for prevention of Bronchial Asthmatic Syndrome	Dr. Rohit Goyal
10	Navneet Upadhyay	12PH.D.08	Development and validation of analytical methods for	Dr. Sameer Sapa

S. No	Names	Registration No.	Research Areas	Guides
			combination of anti-diabetic drugs and its applications in pharmacokinetic study	
11	Aditi Sharma	14PH.D.02	Isolation and Characterization of Bioactive leads from <i>Pinus</i> for prevention of Osteoporotic syndrome.	Dr. Rohit Goyal
12	Tanurajveer Kaur	14PH.D. 07	Design, development and evaluation of nanoemulsion based topical formulation of Seabuckthorn oil for wound healing	Dr. Deepak N.Kapoor
13	Navneet Marwaha	14PH.D. 03	Topic not decided	Dr. Deepak N.Kapoor
14	Manish Kapoor	14PH.D.01	Study impact of Quality by Design (QbD) paradigms and recommend strategies for its adoption by the Indian drug regulatory system to ensure quality medicines	Prof. Neeraj Mahindroo

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

Several UG and PG students receive financial assistance from the university. More than 50 PG students have received scholarship in one form or other. Beside this, some of PG students are also getting AICTE-GPAT scholarship.

Following is the list of PG students who have received financial assistance from the university:

Table PH32: List of PG students getting financial assistance from university

Name	Program
Megha Sharma	M. Pharmacy 2010-12
Deepika Sharma	M. Pharmacy 2010-12
Pooja Chauhan	M. Pharmacy 2011-13
Ananda Jyoti	M. Pharmacy 2011-13
Preety Sharma	M. Pharmacy 2011-13
Kanishk Sood	M. Pharmacy 2011-13
Yamini Chauhan	M. Pharmacy 2011-13
Vandana Sharma	M. Pharmacy 2011-13

Name	Program
Rashmi Gupta	M. Pharmacy 2011-13
Shashi Chauhan	M. Pharmacy 2011-13
Vivek Singh	M. Pharmacy 2011-13
Varun Gupta	M. Pharmacy 2011-13
Rashmi Gupta	M. Pharmacy 2011-13
Arun Sharma	M. Pharmacy 2011-13
Sachin Bhardwaj	M. Pharmacy 2011-13
Shikha Kalia	M. Pharmacy 2011-13
Ritesh Sharma	M. Pharmacy 2011-13
Shalini Thakur	M. Pharmacy 2011-13
Ajay Sharma	M. Pharmacy 2011-13
Shalini Devi	M. Pharmacy 2012-14
Pooja Sharma	M. Pharmacy 2012-14
Upasna Thakur	M. Pharmacy 2012-14
Sushila Sharma	M. Pharmacy 2012-14
Gargi Sharma	M. Pharmacy 2012-14
Neeraj Kumar	M. Pharmacy 2012-14
Richika Chaudhry	M. Pharmacy 2012-14
Namrta Sharma	M. Pharmacy 2013-15
Geetanjali Jain	M. Pharmacy 2013-15
Sheetal Verma	M. Pharmacy 2013-15
Shikha	M. Pharmacy 2013-15
Rakesh Thakur	M. Pharmacy 2013-15
Diksha Sharma*	M. Pharmacy 2013-15
Vivek Verma	M. Pharmacy 2013-15
Amit Sharma	M. Pharmacy 2013-15
Kalpna Sharma*	M. Pharmacy 2013-15
Ankita Gupta*	M. Pharmacy 2013-15
Swati Pal	M. Pharmacy 2014-16
Pooja Kumari	M. Pharmacy 2014-16
Priya Patyal	M. Pharmacy 2014-16
Arnav	M. Pharmacy 2014-16
Poonam Negi	M. Pharmacy 2014-16
Ankita	M. Pharmacy 2014-16

Name	Program
Rashmi Sareen	Ph. D Students 2010
Nitin Jain	Ph. D Students 2010
Shaila Khah	Ph. D Students 2012
Neha Sharma	Ph. D Students 2012
Navneet Kumar	Ph. D Students 2012
Swati Pundir	Ph. D Students 2012
Kamna Sharma	Ph. D Students 2012
Abhishek Chandel	Ph. D Students 2012
Gaurav Sharma	Ph. D Students 2012
Megha Sharma	Ph. D Students 2012
Sunil Kumar	Ph. D Students 2012
Rashmi Gupta	Ph. D Students 2013
Aditi Sharma	Ph. D Students 2013

*AICTE-GPAT Scholarship

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

Yes, the need for new programs and courses is assessed from the time to time. Dean of the Faculty proposes new programs on basis of inputs from the external stake holders including the potential employers, alumni and academicians. Internal inputs are taken from faculty of the School and students. The proposal is put forward to Board of Studies (BOS) which evaluates and assesses the programs based upon the inputs taken around the parameters of employability and global scenario in the profession. Based upon the analysis of BOS and Academic Council considers the approval of new program.

42. Does the department obtain feedback from

a. faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

Yes, feedback is obtained from the faculty on curriculum as well as teaching, learning and evaluation methodologies on regular basis in the faculty meetings, Board of Studies meetings, and other similar forums and is utilized as follows:

- During the BOS meeting for revision of curriculum the feedback from faculty is taken into consideration for the major modification.
- The comments from faculty from each specialization are taken into consideration while designing the curriculum and syllabus.

- Faculty feedback has a major role for the design of practical training with provision for making availability of modern/advance techniques and other required support.

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

Yes, feedback is obtained from the students on staff, curriculum and teaching-learning-evaluation by Dean Academic Affairs. The feedback is shared with the faculty and staff to help them improve the teaching skills. The feedback is also taken into consideration for improving the curriculum and teaching-learning-evaluation.

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

Yes, feedback is obtained from alumni and employers through formal and informal discussions on the programs offered regularly during their visits to the campus. The feedback is utilized in designing and revision of the curriculum based on the experience of alumni in their work places.

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

Shoolini University is too young to have distinguished Alumni as it is only five years old. However, the School have alumni who are not distinguished but are on the path of success. Following is the list of some of the successful alumni:

Table PH33: List of successful alumni

S. No.	Name of Student	Courses	Year	Designation/organization
1.	Dr. Nitin Jain	Ph.D.	2014	Assistant Professor at Bharat Institute of Technology, Meerut, U.P
2.	Dr. Shoumyo Bhattacharya	Ph.D.	2014	Pharmacovigilance Scientist at Quantum Solutions, Chandigarh.
3.	Nitesh Kumar Singh	M. Pharmacy (Pharmaceutics)	2014	Ranbaxy Ltd. Gurgaon, Haryana
4.	Babita Thakur	M. Pharmacy (Pharmacology)	2014	Scientific Writing Officer, IDS, Infotech, Noida, U.P
5.	Yamini Chauhan	M. Pharmacy (Pharmacology)	2013	Pharmacovigilance Scientist at Quantum solutions, Chandigarh.
6.	Shikha Kalia	M. Pharmacy (Pharmacology)	2013	Government Pharmacist at Dharampur, H.P.
7.	Himbhushan Sharma	M. Pharmacy (Pharmaceutics)	2013	Production Officer at Aristo Pharma Pvt. Ltd., Baddi, H.P.

S. No.	Name of Student	Courses	Year	Designation/organization
8.	Deepak Kaushik	M. Pharmacy (Pharmaceutics)	2012	Associate Scientist at Vyome Biosciences, New Delhi
9.	Shashank Purohit	M.Pharmacy (Quality Assurance)	2012	Associate Scientist at Dr. Reddy's Laboratories Pvt. Ltd., Hyderabad
10.	Girish Tanwar	M. Pharmacy (Biotechnology)	2012	Patent Associate, Inttl Advocare, Delhi.

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

The School of Pharmaceutical Sciences organizes student enrichment programs regularly involving external experts to enrich the experience of students and inform them about the latest developments. Representative examples of the programs organized involving external experts are listed below:

Table PH34: Illustrative list of invited lectures from external experts

S.No.	Topic	Expert
1	Advancement in Analytical Techniques	Dr. Vishal Khatavkar, Waters India Ltd., 25 March 2015
2	Pharmacovigilance	Mr. Sunil Verma, ACI-Trainings, Chandigarh, 2 Feb 2015
3	Youth Employability and Skills	Mr. Rohit Anand, Knowledge Ventures, 11 March 2015
4	Medical Scribes	Mr. Saurabh & Mr. Rajvinder, IDS Infotech, Mohali, 06 April 2015
5	Innovation and IPR	Dr. Parikshit Bansal, Excellion Innovations, Mohali, 11 March 2015
6	Product Management and Medical Affairs	Dr. Arvind Singh, Medical Affairs, Venus Remedies, Panchkula, 10 March 2015
7	Pharmacological Trends	Dr. Anil Kumar, Panjab University, Chandigarh, 03 May 2014
8	Human Stories behind Drug Discovery	Dr. Koushik Das Sarma, Sudharshan Chemicals Pvt. Ltd., Pune, Maharashtra, 28 September 2013
9	Resume Writing	Dr. Koushik Das Sarma, Sudharshan Chemicals Pvt. Ltd., Pune, Maharashtra, 02 February 2014
10	Transfer RNA and genetic code: A modified view	Dr. Debabrata Mandal, Vyome Biosciences Private Limited, 03 March 2014

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

The School employs combination of traditional and modern teaching methodologies while encouraging the use of technology. In addition to chalk talk, the School is active participant of eUNIV, LMS and Camtasia® platforms. eUniv helps to provide online teaching material to students. Camtasia® platform is used for recording the video lectures as supplement to classroom teaching. Student-teacher communication, student assignments, tests, evaluations are managed through ERP system. The presentation and analytical skills of students are enhanced through seminar presentations by students. Practical curriculum is linked to the theory courses and equal weightage is given to both practical and theoretical training.

Different teaching methods adopted by the faculty for different programs of Pharmacy are:

- **Chalk Talk:** Teaching through lectures by using chalk talk.
- **Practical:** Curriculum in Pharmacy is enriched with practical to impart experimental & technical skills.
- **Power Point Presentations:** Teaching methodology includes power point presentation for audio-visual content.
- **Lab/Industrial visits:** Visit to research laboratories and pharmaceutical industries is also included in curriculum.
- **Online Lectures:** Online lectures on some specialized topic are also organized.
- **Audio-Visual aids:** These are used for certain behavioral studies on experimental animals.
- **Seminar presentation by students:** The students are encouraged for present seminar on research topic of their interest.
- **Mock and surprise tests:** The tests are based on pharmacy curriculum.
- **Journal Club:** Recent research topics from journals and books are also discussed in journal club to inculcate students about the basics of paper writing, research & evaluation.
- **Classroom quiz:** The quiz is also organized based on curriculum.
- **Live demonstrations:** Demonstration of live practical based on experimental animals and sophisticated instruments are also included.
- **Group discussions:** Basic and technical aspects of Pharmacy are also discussed among students.
- **Assignments:** Assignment on various topics from syllabus is also included.

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

Curriculum of the courses has clearly defined objectives and outcomes. The continuous evaluation system is based around measuring the learning outcomes of the course. The learning outcomes are monitored by continuous evaluation of students in quizzes, term exams, class interactions and practical exams. The progress in achieving the program objectives is periodically monitored by Board of Studies, faculty meetings, student interactions and interaction with other stakeholders

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

School Extension Activities:

Students and faculty members of the School are actively involved in various extension activities. Following is an illustrative list of extension activities organized by the School of Pharmaceutical Sciences:

- Blood Donation camps are organized every year in association with the Blood Banks
- Pharmacist Day and Pharmacy Week are celebrated every year by organizing various events and lectures to increase awareness about the pharmacy profession and role of pharmacist in health care team.
- The Faculty and Students take active part in Swach Bharat Abhiyan.
- Camps are regularly organized to check hemoglobin levels, blood pressure and weight of local villagers and students. The general health care information is also provided.
- Specific campaigns are carried out on outbreak of any disease in the community.

University Level Extension Activities:

- International Yoga Day
- Science Exhibition
- Earth Day
- Environment Day
- Teachers Day

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

Beyond syllabus scholarly activities are regular feature in the Faculty. The journal club, seminars, workshops, conferences, training programs, industrial visits & trainings, invited talks, etc. are regularly organized to keep the students well informed about the developments in the field of pharmaceutical sciences.

The interactions of students with the experts from industry and academia exposes them to the best minds in the field. Faculty members from the School have also delivered guest lectures at different institutes. At university level students participate in various clubs. Details of different conferences, workshops and paper presentations are already provided in point no. 27 and 30.

Following is the list of guest lectures delivered by faculty members from the School of Pharmaceutical Sciences:

Table PH35: List of guest lectures by faculty

S.No.	Faculty	Guest Lecture Title	Institute/organization
1.	Prof. Neeraj Mahindroo	Drug Target Identification validation & Screening.	Summer course UGC-Networking, University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh, August 10, 2013.
2.	Prof. Neeraj Mahindroo	Small Molecule Modulators of Hedgehog- Gli Pathway	International Symposium on Recent advances in Medicinal Chemistry, NIPER, Mohali, Punjab, September 10, 2014.
3.	Prof. Neeraj Mahindroo	Natural Products Drug Discovery: Keeping in Step with Changing Technology	Government College of Pharmacy, Rohru, H.P., May 16, 2014
4.	Prof. Neeraj Mahindroo	Modern Techniques in Natural Product Drug Discovery	Abhilashi College, Ner Chowk, H.P. 2014
5.	Dr. Rohit Goyal	Drug Discovery and Therapeutics	Department of Pharmacy, GLA University, Mathura, U.P., February 2014
6.	Dr. Rohit Goyal	R&D in Pharmaceuticals	Government College of Pharmacy, Rohru, H.P. May 08, 2015
7.	Dr. Deepak Nandkishore Kapoor	Parenteral Products	Government Polytechnic for Women, Kandaghat, H.P., May 15, 2015
8.	Dr. Afroze Alam	Natural products	Dreams college of Pharmacy, H.P., May 2015

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

Yes, the program/School is approved by following governing agencies

- Pharmacy Council of India
- AICTE
- UGC
- CPCSEA for Animal House

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

Faculty is focusing its research effort on exploring the unique flora of Himalayan region for controlling the diseases of national relevance. More than 30 such plants are currently being investigated and some promising leads for cancer, osteoporosis, asthma, and anti-infectives have been identified and are being followed up. Novel formulations for herbal and synthetic drugs have been developed at the School. Details of collaborations, published research papers, patents filed and consultancies are provided in point no. 18, 22, 23 and 24.

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

Major Strengths:

Access and Expertise to Work on Himalayan Biodiversity:

The School of Pharmaceutical Sciences is located in north western Himalayas which is defined as one of the hotspots of biodiversity. Most of the plants from the region have still not been explored for their biological activities. The School has expertise in natural products drug discovery and is working on more than 30 unique plants from Himalayan region. The efforts have provided some promising leads which are being explored further as potential drugs. The School is also working on development of nanosystems for the delivery of natural products as well as synthetic drugs.

Distinctive Leadership and Experienced Faculty:

The School is led by Professor Neeraj Mahindroo, a post-doc from reputed institutions of U.S. and Taiwan having wide experience in teaching and research. The School has well qualified faculty with extensive experience in teaching & research in diverse areas of pharmaceutical sciences. Fifty percent of faculty is with doctoral degrees and some are with Post-Doctoral experience.

Collaborations with Industry:

The School is actively involved in industry-institute partnership projects. This includes project on troubleshooting of formulation related problems that were successfully solved for Meridian Healthcare Ltd., Solan. Similarly, the School is running projects for Tirupati Healthcare Ltd., Paonta Sahib, H.P., on development of novel formulations of different drugs such as a Nano formulation for Vitamin D3 and development of an anti-diabetic formulation containing a natural product & protein supplement.

Compliance and Accreditations with Regulatory Bodies:

The School has obtained all the essential accreditations from standardized government organization needed for smooth and effective running of B. Pharm. and M. Pharm. Courses. These accreditations include approvals from PCI, AICTE and CPCSEA for animal house facility. Approval from PCI allows B. Pharm. students to register as Pharmacist. Accreditation with AICTE gives the advantage of obtaining scholarship in form of stipend for GPAT qualified M. Pharm. students, which they are already availing.

Quality Research and Training:

In order to maintain the quality of research, the researchers are required to submit papers to journals that are listed in Scopus or Thompson Reuters. The curriculum includes innovative programs to introduce B. Pharm. students to research from 1st Semester itself that continues till 8th Semester. The students are encouraged to utilize latest technology for their experimentation work. The School has specialized SPRINT program for students, where programs like persona enhancement, resume writing, interview facing, group discussion, presentation skills and expert talks by professionals from industry and academia help students enhance their soft and technical skills.

Weaknesses:**Extramural Funding:**

Being only five year old, the School has limited number of extramurally funded projects. There are some projects with the School and the faculty is working hard to obtain more funded projects. Several projects have been submitted and are currently under review with various funding agencies.

High-end Facilities:

Drug discovery and development is a multidisciplinary area, which requires high-end facilities. Currently, the School is having basic equipment and lab facilities and require more advanced level amenities. Establishment of well-equipped labs would induce a quest for excellence in research among the

students. To overcome this the School is encouraging its faculty to build collaborations with other departments of the University and external collaborators.

Lab Accreditations from Standardized Agencies:

The School needs to get its labs accredited from agencies like NABL and AYUSH. These accreditations would be useful in gaining confidence and recognition of external funding agencies and increase the chances of obtaining consultancy work from industry as well as academic institutions. Efforts are being made to further improve the research infrastructure in terms of obtaining accreditations from standardized agencies such as NABL and AYUSH.

Novice in Industrial Collaborations:

Although the School has made good beginning with industrial collaborations, they need to be further strengthened to attract collaborative and consultancy projects. Currently, only 2-3 collaborations are underway and more efforts are needed increase such collaborations. To achieve this, the School strives to build its confidence with the industry in terms of deliverables.

Quality of Students:

Himachal Pradesh has many institutions and it is not always possible to attract bright students as they have their own options. However, the School is working to change this trend by providing high quality education, training and better employability in form of good placements to the students. This is expected to communicate a positive message to bright and motivated aspirants to join the School.

Opportunities:

Development of the School as Centre of Excellence for Natural Products Drug Discovery and Development from Himalayan Plants:

Being located in the Himalayas provides an opportunity to explore the unique flora for the diseases of national relevance. There are number of unexplored plants in Himalayan region that opens new vistas for research. Studies regarding genotypic, altitudinal, longitudinal and climatic variations for medicinal plants are quite rare. As part of initiative of the University to work on sustainable utilization of Himalayan biodiversity, the School has wide scope and opportunity to tap this area of research and be the best in this area.

Introducing New Interdisciplinary Courses:

With the advancement in the field of pharmaceutical sciences, there is a need to introduce new interdisciplinary programs. The knowledge of students would be updated by introducing new courses such as Pharmacogenomics,

Pharmacoinformatics, Pharmacoeconomics, Medical writing, Biopharmaceutical Product Development etc. Since, these courses are not being offered currently, the School has an opportunity to introduce such new courses. There is an opportunity to work in collaboration with NSDC for vocational programs.

Possibility to Explore New Collaborative Research Programs:

The School has the advantage of being in the vicinity of other faculties of the university such as Faculty of Applied Sciences and Biotechnology, Basic Sciences, Engineering and Technology, Management and Liberal Arts. This provides the faculty with the opportunity to interact with each other and work on different stages of drug discovery and development process in their respective departments depending on their expertise. The University has also constituted Cancer Research Group where faculty members from different fields are organized into sub-groups with different specialization and expertise to identify and work on key areas of cancer research.

Better Job Opportunities for Students:

Location of the School in the largest pharmaceutical industry hub in Asia provides opportunity to interact and expose the students to industry regularly. It also provides ample opportunities for students for employment. The School is in regular communication and interaction with number of pharmaceutical and healthcare companies such as Abbott India Ltd., Wockhardt Ltd., Agilant Technologies, Morepen Laboratories Ltd., Sentiss Pharma Pvt. Ltd., Ind-Swift Laboratories Ltd., Chiros Pharma where students of the School have been successfully placed for training and employment.

Opportunity in Natural Products Research:

Few institutes are working on natural products research because of the problems associated with isolation, standardization and stability of the active compounds. Since its inception, the School has identified the advantages of natural product research and is aggressively engaged in this field. The School has opportunity to further elaborate the work by involving other natural product experts, outside labs and natural product industry in its quest to come out with novel plant based products.

Challenges:

Attracting Major Projects:

School of Pharmaceutical Sciences has been successful in getting smaller grants from funding agencies. Now, it aspires to obtain high-level multi-crore projects for the overall development and improvement of its research infrastructure.

Development of International Standard Labs:

In order to further improve the quality of research and impart international standard practical training to the students, the infrastructure of the labs should also be enhanced to international level. The task would require dedicated efforts from the faculty, interest of the industry and support from the funding agencies.

Attracting Good Quality Students and Faculty:

It is normally difficult to attract highly motivated and talented students and faculty at a private university as they often choose to work in government institutes. The general perception among the students is that private institutes do not conduct quality research. The School is endeavoring to change this perception by attracting high quality faculty, obtaining more research grants and generating high impact publications.

Developing Culture of Innovation:

There is a need to develop the culture of innovation in the School both among the students and faculty. An extra step is required to generate new ideas and implement them practically to obtain novel and innovative results in terms of industrial applications.

Improving Technical Skills of the Students:

It has been observed that the technical skills of the fresh graduates is not always as per the requirements and expectations of the industry. This may be due to less exposure of the students to industrial environment during their course of study. Thus, in order to bridge the gap between industry expectations and technical skills of students, they need to spend more time in the industrial set-up and have hands-on experience from the technical experts of the industry.

52. Future plans of the department.**Further Enhancing the Employability of Students through Skill Development Programs:**

School of Pharmaceutical Sciences recognizes the importance of skill development of the students. The School intends to provide quality infrastructure and training support to facilitate learning, apprenticeships, profession specific skill development, soft skills, e-learning, training for self-employment and entrepreneurial training. A university/School level mechanism will be developed to plan, implement and monitor the skill development of the students. The skill development programs will be aligned with National Skill Development Program. These steps would ensure that the students become globally competent in the job market.

National and International Collaboration for Research and Academic Exchange:

The School intends to collaborate with reputed national and international institutes of excellence in pharmaceutical education and research to improve research capabilities. Opportunities for academic exchange both for faculty and students are being explored. The focus would be on sharing the research expertise, instrumentation, lab facilities and student exchange.

Efforts to Attract extramural Project Grants:

School plans to attract extramural funding through collaborative projects. The School would work to obtain extramural research projects of national importance from national and international funding agencies in order to boost up and strengthen its research set-up. The idea is to conduct high quality product/ result oriented research in diversified areas of pharmaceutical sciences with clearly defined deliverables. School would also work to increase industrial collaborative and consultancy projects.

To Add New Programs in Upcoming Areas of Pharmaceutical Sciences:

In order to keep the students updated with the current developments in the field of pharmacy and to provide work-force to upcoming fields, the School would constantly strive to introduce new programs that would emphasize on the latest requirements and expectations of pharmaceutical fraternity from the fresh graduates. Some of these programs where the School has taken initiative to train students by inviting professional from different upcoming fields are pharmacovigilance, medical scripting, advanced analytical techniques, product management & medical affairs, innovation and IPR. Thus, by the help of innovative programs the School will be able to contribute to national development by providing trained work-force.

Extension Activities:

There is lack of knowledge in general population about diseases, safe usage and storage of drugs. Thus, in order to create awareness in the public, the School plans to participate with the industry in various extension activities such as cancer awareness campaign, general health checkup, awareness about use of drugs, problems of drug resistance and drug abuse. In an attempt to inculcate value system among the students, School of Pharmaceutical Sciences aims to conduct more extension activities that are beneficial to the students, researchers and public at large. These would include blood and organ donation camps, workshops, seminars, training programs, guest lectures, conferences and summer Schools.

7. Evaluative Report of School of Business Management & Liberal Arts

The School of Business Management & Liberal Arts strives to train its students to become excellent managers and leaders with higher degree of specialized knowledge and inculcate in them an industry oriented competitive mindset. The School has nationally and internationally acclaimed full-time faculty who have several years of experience either as academicians or having worked in senior positions in the industry. Mentors from leading industries and top organizations have been supporting both faculty and the students. Links with the corporate world and industry enable the School to develop vibrant, multi-disciplinary, and progressive courses that reflect the business climate, inculcate values in students, and keep the teaching and research relevant and challenging. Teaching pedagogy based on extensive case studies, presentations, daily business and current affairs update sessions, group discussions, simulations, industrial visits and frequent guest lectures give students the appropriate environment to build on their creative and entrepreneurial skills. The School fully leverages University's Learning Management System (LMS) and eUniv program- all lectures are fully uploaded on the LMS and many examinations are conducted online, especially for the MBA program.

As part of the School's ongoing endeavor to provide best-in-class skills and education to the students, a value addition 'SPRINT MBA' Program, which has been inspired by Stanford University's mini-MBA has been implemented. The outcome of SPRINT enhances business skills, confidence, attitude and effectiveness of the students in the area of management and consequently, the School has recorded amongst the best placements in the region. Different agencies have acclaimed the School over a period of time for its achievements. It has been ranked 19th among top private Business Schools in India by *Dainik Bhaskar*, adjudged as the 'Best Private Upcoming Business School' by ASSOCHAM India and rated A+++ by Go-Education. DNA, the leading Newspaper, awarded the School for 'Innovation in Placements'.

1. Name of the Department: School of Business Management & Liberal Arts

2. Year of establishment: 2009

3. Is the Department part of a School/Faculty of the university?

Yes, School of Business Management & Liberal Arts is a part of Faculty of Management Sciences & Liberal Arts

4. Names of Programs offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.):

Following programs are offered by the School:

Table MT1: Programs Offered

Level	Program
UG	1. B.Com (Hons) 2. BBA 3. B.A. Hons. Economics
PG	MBA with specialization in: <ul style="list-style-type: none"> • Human Resource Management • Marketing • Finance • Biotechnology • Business Process Management • Pharma & Health Care
M.Phil.	-
Ph.D.	Ph.D Management with specialization in: <ul style="list-style-type: none"> • Business Management • Environment Management Ph.D Economics
Integrated Masters	-
Integrated Ph.D.	-
D.Sc.	-
D.Litt.	-

5. Interdisciplinary Programs and departments involved:

School of Business Management & Liberal Arts is offering following programs in collaboration with other schools:

Table MT2: Program(s) Offered in Collaboration with Other Schools

S. No.	Program	School
1	MBA <ul style="list-style-type: none"> • Pharma & Health Care • Biotechnology 	Pharmaceutical Sciences Biotechnology

6. Courses in collaboration with other universities, industries, foreign institutions, etc.:

GENPACT, the industry and thought leader in BPO has partnered with the University for an MBA program in Business Process Management (BPM). The objective of the partnership has been to combine the expertise and capability of both GENPACT and Shoolini's School of Business Management & Liberal Arts to develop and impart a specialized MBA Program to create an immediately employable pool of managers for GENPACT and similar BPO organizations. Over the last five years, several MBA students from the School have been placed in senior positions at GENPACT.

7. Details of Programs discontinued, if any, with reasons: None

8. Examination System: Annual/Semester/Trimester/Choice Based Credit System:

- Since its inception, School of Business Management & Liberal Arts has followed the semester system for its programs
- Based on inputs from the stakeholders, and benchmarking with leading Global Business Schools, the MBA program was changed to a quadmester system in 2014. The objective of this change is a vision to create globally competitive skilled business leaders with relevant management knowledge, analytical abilities, communication skills, leadership potential and ability to work in a team.
- From session 2015-16 the School has adopted Choice Based Credit System as per the recommendation of UGC.

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

Since managerial and leadership skills are need of the hour in corporate and academic world, skill based curriculum has been developed in each School of the University. The School of Business Management and Liberal Arts has been actively delivering many of these skill enhancement courses offered by different Schools across the University especially in the area of management, English, economics and soft skills. The School also manages and runs the skill up gradation SPRINT program across all Schools of the University.

List of such courses has been given below:

Table MT3: Participation in Courses offered by Other Schools

Courses	Program	School
Persona Enhancement	B.Tech (Computer Science & Engineering)	School of Electrical & Computer Science Engineering
	B.Tech (Electronic & Communication Engineering)	
	B.Tech (Bioinformatics)	
MBA Courses of second year	B. Tech.-MBA	
Persona Enhancement	B. Tech Civil Engineering	School of Mechanical and Civil Engineering
	B. Tech mechanical Engineering	
Marketing Management	B. Tech Biotechnology	Bioengineering & Food Technology
Persona Enhancement	B. Tech. Biotechnology	
	B. Tech. Food Technology	
Entrepreneurship Development	B. Tech. Biotechnology	
	B. Tech. Food Technology	
Principles of Engineering Economics and Management	B. Tech. Biotechnology	
	B. Tech. Food Technology	
Biostatistics	M.Tech Biotechnology	
Computer Applications & Statistics	Ph.D Food Technology	
Pharma Management	B. Pharmacy	Pharmaceutical Sciences
Communication Skills & Personality Development		
SPRINT	M. Pharmacy (Pharmaceutics)	
SPRINT	M. Pharmacy (Pharmaceutical Chemistry)	
SPRINT	M. Pharmacy (Pharmacology)	
Sociology	B. Sc. -M.Sc (Physics)	School of Physics & Material Sciences
Communication Skills & Personality Development	B. Sc. -M.Sc (Physics)	
Introductory Mathematics I&II	B. Sc. -M.Sc (Physics)	
Statistics & Computer Applications	Ph.D Physics	

Courses	Program	School
Sociology	B. Sc. -M.Sc (Chemistry)	School of Chemistry
Communication Skills & Personality Development	B. Sc.-M.Sc (Chemistry)	
Introductory Mathematics I&II	B. Sc.-M.Sc (Chemistry)	
Computer Application	M.Sc Chemistry	
Statistics & Computer Applications	Ph.D Chemistry	
Sociology	B. Sc-M.Sc (Zoology)	School of Biological & Environmental Sciences
Communication Skills & Personality Development	B. Sc-M.Sc integrated(Zoology)	
Introductory Mathematics I&II	B. Sc.-M.Sc (Zoology)	
Statistics & Computer Applications	Ph.D Zoology	
Statistics & Computer Applications	Ph.D Botony	
Statistics & Computer Applications	Ph.D Environmental Sciences	
Biostatistics	B. Sc. Biotechnology	School of Biotechnology
Biostatistics	B. Sc. Microbiology	
Biostatistics	M.Sc Biotechnology	
Biostatistics	M.Sc. Microbiology	
Biostatistics	M.Sc Biochemistry	
Computer Applications & Statistics	Ph.D Biotechnology	
Computer Applications & Statistics	Ph.D Microbiology	

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

Table MT4: Number of Teaching Posts

Post	Sanctioned	Filled	Actual (including CAS & MOS)
Professor	04	04	04
Associate Professors	07	06	06
Asst. Professors	21	16	16

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

The School of Business Management & Liberal Arts has multiple nationally and internationally acclaimed full-time faculty who have several years of experience either as academicians or having worked at senior positions in the industry.

Table MT5: Faculty Profile

Name	Qualification	Designation	Specialization	years of experience	No. of Ph.D/ M.Phil students guided for the last 4 years
Atul Khosla	MBA (Jamnalal Bajaj), B.Tech (IIT Kanpur)	Professor-cum-Dean	Finance	22	-
O. P. Monga	Ph.D, M.Phil., M.A.	Professor-cum-Associate Dean	Sociology of Family, Social Gerontology, HR	37	01
Y.S. Negi	Ph.D (UC Berkeley, USA), M.Phil., M.Sc. Agriculture Economics	Professor	Forest Economics & Policy	35	-
Narinder Verma	Ph.D Commerce & Management, PGDM (IIM Calcutta), PGDCA, B.Tech (IIT Delhi)	Professor-cum-Director Special Projects	Finance & Decision Sciences	20	-
Kuldeep Chand Rojhe	Ph.D, MBA, MASS Com, PGJMC, DSM	Associate Professor	Marketing	14	-
Abhinav Sheoran	MBA, M.Sc. Biotechnology, B.Sc. Biosciences	Associate Professor	Biotechnology , Marketing	8	-
Kesari	Ph.D, M.Phil., M.A., B.A. (Hons.) Economics	Associate Professor	Environmental & Resource Economics	8	-
Saibal Basu	Ph. D. & M.A. Economics (University of Notre Dame, Indiana, USA), BSc Economics	Associate Professor	Development Economics	12	-

Name	Qualification	Designation	Specialization	Years of experience	No. of Ph.D/ M.Phil students guided for the last 4 years
Rakesh Shukla	Ph.D, M.A. Statistics, M.A. Sociology	Assistant Professor	Statistics	7	-
Devesh Kumar	MCA, MBE, UGC-NET, SLET	Associate Professor	Information System	15	-
Munish Prabhakar	MBA, B.Sc. (Hons.) Geology	Associate Professor-cum-Director Placement	Marketing	16	-
Nikhil Uprety	MBA, B.Sc., UGC-NET	Assistant Professor	Marketing	13	-
Nitin Gupta	MBA, PGDBM, B. Com., Ph.D (Pursuing)	Assistant Professor	Finance	5	-
Kamalkant Vashisth	Ph.D, MBA, UGC-NET, BBA, Ph.D (Pursuing),	Assistant Professor	Sales, Insurance	14	-
Pooja Verma	MBA, BBA, Ph.D (Pursuing)	Assistant Professor	HRM	6	-
Shivendra Gupta	MBA, BBA, Ph.D (Pursuing),	Assistant Professor	Finance	4	-
Chander Mohan Gupta	MBA, M. Com, B. Com., Law (Pursuing)	Assistant Professor	Financial Accounting, Tax	9	-
Varsha Patil	A.C.S., B. Com., CS (in Practice)	Assistant Professor	IPR, Company Regulations	5	-
Kiran Bala	M.Phil., M.A. Sociology, Ph.D (Pursuing)	Assistant Professor	Sociology	1	-
Prachi Kapil	MBA, BCA, Ph.D (Pursuing)	Assistant Professor	HRM	2	-
Gayatri Katoch	M.Phil., M.A., Ph.D (Pursuing)	Assistant Professor	English	13	-
Sumit Verma	MBA, B. Sc.	Assistant Professor	Marketing, HRM	2	-
Pawan Sharma	MBA, B. Com.	Assistant Professor	Finance	2	-
Shubhika Sharma	MBA, BBA	Assistant Professor	Finance,HRM	2	-
Sonia Dadwal	MBA, B.A.	Assistant Professor	HRM, Marketing	4	-
Harsha Thakur	MBA, B.A., DCA	Assistant Professor	HRM, Finance	4	-

12. List of Senior Visiting Fellows, adjunct faculty, emeritus professors:

As given below.

Several leading corporate professionals and academicians contribute to the School of Business Management & Liberal Arts through regular interactions with its students and faculty. List of such faculty has been enumerated below:

Table MT6: List of Senior Visiting and Adjunct Faculty

Category	Name	Organization
Visiting Faculty	Rajendra Abhange,	Senior Director Technology, Gabriel India
	Rajender Sharma	Director Corporate Affairs & General Counsel- South Asia, Du PONT India.
	Kamlesh Vyas	Director FISB Delhi , ex CEO ACME Associate Director at EY Gurgaon India
	S. Sridhar	Global Partner Oliver Wyman, Ex MD Citi Bank
	Ritu Bergeron	Founder, Ankur Capital, Mumbai
	Pratik Ved	Senior Brand Manager, UNilever India
	Jadhojit Das	Executive Director & HR Head, ICICI Prudential
	Pooja Malik	Corporate General Manager (HR), Anand Automotive Ltd., New Delhi
	Aarti Nihlani	Principal, Oliver Wyman, Mumbai
	Gaurav Mehta	Senior Strategy Consultant at Roland Berger, Hong Kong
	Ashish Khosla	Vice-President, UNB Abu Dhabi
	Dr. Ashoo	Independent Consultant, UAE
	Sumit Gupta	Managing Director, Meredian Pharma, Solan
	Pravesh Srivastava	Ex Senior MD & COO, Anand Group
Adjunct Faculty/Professor	Andrea Wright	Brown University, USA
	Prof. Ashley Braganza	Brunel University London
Professor of Eminence	Prof. S.C. Tewari	Former Prof. & Head, Department of Management Sciences, University of Horticulture & Forestry, Solan

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

Nil

14. Program-wise Student Teacher Ratio:

- UG: 21.5:1
- MBA: 11.8:1

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

Following academic support and administrative staff is available:

Table MT7: Number of Academic Support and Administrative Staff

	Sanctioned	Filled	Actual (including CAS & MOS)
Technical	02	02	02
Administrative	05	05	05

16. Research thrust areas as recognized by major funding agencies

School of Business Management & Liberal Arts promotes an interdisciplinary research agenda that lies within the overarching framework of Himalayan sustainability. Major research themes include:

- Human Resource Management
- Marketing
- Consumer Behavior
- Finance and Banking
- Environmental Management
- Market accessibility
- Development Economics
- Agricultural/Rural Economics

In addition, the School is engaging with the World Gold Council to develop a Center of Excellence for Gold.

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

The School of Business Management has been awarded a prestigious World Gold Council Project to look into the role of economic sustainability in Himachal Pradesh. The details are as follows:

Table MT8: Faculty Ongoing Projects

S. No.	Funding Agency	Faculty	Project Title	Grants Received
1.	World Gold Council	Dr. Narinder Verma Prof. Atul Khosla Dr. Kuldeep Rojhe	Role of Gold in Economic Sustainability of Himalayan Region with a Focus on Himachal Pradesh	50,000 /-

The School is also negotiating a Research Center for Gold with the WGC. Funding associated will include a Chair, associated research fellowships and other scholarships.

18. Inter-institutional collaborative projects and associated grants received:

a) National collaboration

b) International collaboration

The School has submitted projects jointly with the University of Brunel, UK to the British Council. We have yet to receive any grants for this endeavor.

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

20. Research facility / centre with

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

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

- One IT Lab sponsored by Innohive India Pvt. Ltd.
- One E-Lab sponsored by Ankur Capital, Mumbai.
- One E-Lab sponsored by Anand Toyota Pvt. Ltd

22. Publications:

*Number of papers published in peer reviewed journals (national/international):

Total number of publications: 25

1. Monga A, Verma N, Monga OP. A Study of Job Satisfaction of Employees of ICICI Bank in Himachal Pradesh. *Human Resource Management Research*. 2015. **5**: 18-25.
2. Shukla R, Rathore R. Do ESOP Enhance Productivity Performance in Pharmaceutical Sector: A Study of selected Pharmaceutical Companies. *IFRSA Business Review*. 2015. 15-22
3. Shukla R, Rathore R. Emergence of Employees Stock Option Plans and Relationship with Productivity: Towards a Conceptual Framework. *BBIT Journal of Management*. 2015. 46-60.
4. Raj L. Service Quality and Customer Satisfaction in DTH Services in Kangra, Himachal Pradesh. *International Journal of Research in Computer Application & Management*. 2015. **5(1)**: 111-115.
5. Kumar R, Shukla RK, Rojhe KC. Customers behavior towards counterfeit products – a case of solan town in himachal Pradesh. *Global journal of Multidisciplinary Studies*. 2015. **4**:131-139. IF:2.389.
6. Kapil P. Green HRM- Engaging Human Resource in reducing carbon footprint and enhancing environment sustainability: A Case study based approach. *International Journal of Engineering, Technology, Science and Research*. 2015. **Special Issue**: 5-14.
7. Verma P, Monga OP. Understanding Quality Work Life in Contemporary World. *International Journal of Emerging Research in Management & Technology*. 2015. **4(4)**: 51-56.
8. Monga OP. Leadership Theories and Educational Management- An Insight. *Biz & Bytes, A Research Journal of Management & Technology*. 2015. (Accepted).
9. Sulochna, Rojhe, KC. Challenges & problems faced by rural customers in banks - a case study of solan district in Himachal

- Pradesh. Proceedings of 2nd International conference on innovation & sustainability, managing for change, 2015. 10-15.
10. Sharma VK, Monga O.P. Traditional Knowledge: Key for Rural Agriculture Development. Proceedings of the conference, Russian University, Moscow, Russia. 2014. Vol 1: 190-192.
 11. Bansal AK, Monga OP. A Study on Impact of Socio-demographic Variables on Job Satisfaction of Managers in Pharmaceutical Industry in Himachal Pradesh. *Asian Academic Research Journal of Social Sciences and Humanities*. 2014. **1(24)**: 123-139.
 12. Bansal AK, Monga OP. A study on Job Performance of Managers in Pharmaceutical Industry in Himachal Pradesh. *International Journal of Research in Management and Commerce*. 2014. **5(8)**
 13. Singh R, Monga OP. Changing status of Women Entrepreneurs in Himachal Pradesh. *European Academic Research*. 2014. **2(4)**.
 14. Verma P, Monga OP. Attitudinal Study of Quality of Work Life at an Electronics Company. *European Academic Research*. 2014. **2**: 8549 – 8562.
 15. Sulochna, Rojhe K. Study of Problems & Challenges of Women Entrepreneurs – A Study of Solan & Shimla districts of Himachal Pradesh. *Indian Journal of Scholarly Research*. 2014. **III(VII)**: 13-14.
 16. Sharma VK, Monga OP. Review-Traditional Medicine Systems Across Indian Himalayas. *Life Sciences Leaflets*. 2013. **10**: 28-34.
 17. Singh R, Monga OP. Women Entrepreneurs: A Study of Current Status, Challenges and Future Perspectives in the State of Himachal Pradesh. *International Journal of Management Research and Review*. (2013). **3 (12)**: 3901-3014.
 18. Khan S, Raj L. A Study on Direct to Home Service Quality with Special Reference to Mandi District of Himachal Pradesh. *International Journal of Education & Management Studies*. 2013. **3(4)**: 431-436.
 19. Rojhe K, Sulochna. Quality education and teacher development. *Asian Academic Research Journal of Social Sciences and Humanities*. 2013. **1(14)**: 170-174.
 20. Upreti N. Advertising to Children- Commercializing the Innocence. *Journal for International Academic Research for Multidisciplinary*. 2013. **1(5)**.
 21. Upreti N. Neuromarketing- A Tool of Selling to the Brain. *International Journal of Marketing and Technology*. 2013. **3(8)**:
 22. Upreti N. Shockvertising- Method or Madness. *Abhinav Journal*. 2013. **2(6)**.

23. Singh R, Raghuvanshi N. Women Entrepreneurship Issues, Challenges and Empowerment through Self Help Groups: An Overview of Himachal Pradesh. *International Journal of Management Research and Review*. 2012. **2** (1): 77-90.
24. Kumar D. Cloud Computing: Describing the concept, features and concerns from a business perspective. *International Journal of Research in Computer Applications and Management*. 2012. **2**(7).
25. Kumar D. Cloud computing for SMEs in Indian context. *JIM QUEST- Journal of Management & Technology*. 2012. **8**(1): 88-94.

***Monographs**

***Chapters in Books**

- Monga, O.P., Ryhal, P.C., Chauhan, R.K. & Monga, Om Prabha (2012). "Self help Groups and Empowerment of Women: A Case Study of Kinnaur District of Himachal Pradesh." In M.C. Behera, R.C. Parida & D. Baruah (Eds), *Development Dynamics: Finance, Empowerment and Entrepreneurship*. Guwahati: DVS Publishers.
- Garg, R.C.; Monga, O.P. and Verma, O.P. (2013). "Investment Awareness among Tribal Horticulturists: A Case Study of District Kinnaur, Himachal Pradesh." In S R Pandhi (Ed), *Current Tribal Situation: Strategies for Planning, Welfare and Sustainable Development*. Delhi: Mangalam Publishers.
- Kumar, D., Samalia, H.V., Verma, P. & Sharma, G. (2015). "The Role of ICT in Education: Moodle as a Pedagogical Tool in a Private University". In D. Narang, A. Varshney, M.Kumari, A. Tripathi & R. Singh (Eds), *Emerging Global Economic Perspectives*, New Delhi: Orange Books International Publications.

***Edited Books**

Nil

***Books with ISBN with details of publishers**

- Upreti, N. (2015). "The Maut-e-Maticians", Half Baked Beans, ISBN-10: 8192893669, ISBN-13: 978-8192893662
- Upreti, N. (2013). "On the Verge", Cyberwit.net, ISBN-10: 8182534682, ISBN-13: 978-8182534681
- Upreti, N. (2013). "Alfaaz", LOGIHQ Training and Publishing Pvt. Ltd.

- Upreti, N. et.al. (2014). “Myriad Tales – A season of Thrills, Chills & Spills”, Half Baked Beans, ISBN-10: 8192893650, ISBN-13: 978-8192893655
- Chattri, H. (2013). “When Love Happens”, Good Times Books Pvt. Ltd., ISBN-10: 9380619642, ISBN-13: 9789380619644.
- Chattri, H. (2012). “Ujle Panne”, Rochak Publishing, ISBN-10:938169608X, ISBN-13: 9789381696088.
- Upreti, N. et.al. (2014). “You, Me and Zindagi-2”, Omji Publishing House Pvt. Ltd., ISBN-10: 938402810X , ISBN-13: 978-9384028107
- Upreti, N. et.al. (2015). “Case Files of the Dead”, Author’s Ink, ISBN-10: 192955583, ISBN-13: 978-8192955582.

***Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.)**

***Citation Index – range / average**

***SNIP**

***SJR**

***Impact Factor – range / average**

***h-index**

23. Details of patents and income generated

NIL

24. Areas of consultancy and income generated:

The School of Business Management & Liberal Arts has been offering consultancy services primarily in the fields of personality development, skill development including managerial & leadership skills and soft skills. However, the focus now will be on management consultancy services. Some of the consultancy services provided by the School are highlighted below:

Table MT9: Areas of Consultancy and Income Generated

S. No.	Year	Consultancy Topic/Area	Amount (Rs)	Funding Agency
1	2015	Financial Literacy in Himachal Pradesh	100,000/-	National Stock Exchange of India (NSE)
2	2015	Career Counseling, 4 th June, 2015	-	CST Dholanji, Solan
3	2015	Social Entrepreneurship Opportunities in the Himalayan Region	20,000/-	Ankur Capital, Mumbai
4	2015	Study of Automotive Industry in Himachal Pradesh	10,000/-	Anand Toyota
5	2015	'Personality Development & Soft Skills' for BBA Students, 23-25 th March, 2015	-	Shoolini Institute of Life Sciences & Business Management, Solan under H.P. University
6	2014	Buying Potential of Solan Town	40,000/-	Propbrowser Realty India Pvt. Ltd.
7	2013	'Personality Development & Soft Skills' for BBA Students, 25-27 th November, 2013	-	Shoolini Institute of Life Sciences & Business Management, Solan under H.P. University
8	2013	SPRINT for UG Students- Soft Skills & Persona Enhancement, 15-16 th February, 2013	-	SCOBACS, Solan
9	2012	Workshop for UG Students- Professional Skills, 19-20 December, 2012	-	Government Degree College, Solan
10	2012	Workshop on Personality Development & Soft Skills for BBA Students, 29 th November- 1 st December, 2012	-	Shoolini Institute of Life Sciences & Business Management, Solan under H.P. University
11	2011	Workshop on Personality Development	-	Shoolini Institute of Life Sciences & Business Management, Solan under H.P. University
12	2010	Campus to Corporate (C2C) Seminar	-	Shoolini Institute of Life Sciences & Business Management, Solan under H.P. University

Apart from the above consultancy services, faculty members of the School have been invited by various institutes/organizations/industries to provide consultancy in their area of expertise. The details of such services are enumerated below:

Table MT10: Other Consultancy Services Provided

S. No.	Name of the Faculty	Institute/Organization	Session/Topic
1.	Prof. Atul Khosla	Oliver Wyman, PLC (Leading International Consultancy)	Global Partner & Advisor to Oliver Wyman on Multiple Projects
		Security and Exchange Board of India (SEBI), Ministry of Finance, GoI.	Transforming SEBI
		ICICI Group	Various Projects
		Gabriel India Ltd.	Outsourcing Enhancement
2.	Prof. O.P. Monga	State Council of Education Research and Training, Solan, on 29 October, 2014	Right to Education, 2009: A Human and Social Approach' and on 'Ethics in Leadership
		ICSSR and Faculty of Law, HP University Shimla, from July 15-26, 2013	Rating Scales
3.	Mr. Chander Mohan Gupta	Government College Naina Devi, Himachal Pradesh, 4 th March, 2015	Career options available with students after graduation
		Government College Ghumarwin. Distt Bilaspur, 5 th March, 2015	Career options available with students after graduation
4.	Ms. Prachi Kapil	Government Polytechnic for Women, Kandaghat, Solan, 9-11 th June, 2015	Short Term Course On Communication Skills For Effective Curriculum Implementation, 9-11 th June, 2015
5.	Ms. Gayatri Kanwer	Government Polytechnic for Women, Kandaghat, Solan, 9-11 th June, 2015	Short Term Course On Communication Skills For Effective Curriculum Implementation, 9-11 th June, 2015
6.	Mr. Devesh Kumar	District Industry Centre (DIC), Solan	Training to Entrepreneurs on 'Basic IT Skills', 2012
7.	Mr. Kamal Kant Vashist	District Industry Centre (DIC), Solan	Training to Entrepreneurs on <ul style="list-style-type: none"> • Stress Management • Entrepreneurship- Pros & Cons, 2012

25. Faculty selected nationally / internationally to visit other laboratories / institutions / industries in India and abroad

Faculty members of the School of Business Management & Liberal Arts visited various organizations, institutes and industries for participation in workshops, conferences and training programs. List of such visits is enumerated below:

Table MT11: Institutions/Organizations/Countries Visited by the Faculty

S. No.	Name of the Faculty	Institution/Industry/Country Visited	Purpose of the Visit
1.	Prof. Atul Khosla (Selected)	Central Bank Sri Lanka	Presentation on to Governor Central Bank on Developing a Central Repository for Sri Lanka, March, 2014
		Ministry of Finance, Government of India	Presentation to Finance Minister on SEBI Transformation, January, 2014
		ISB, Mohali	Lead Speaker for NASSCOM ISB START-UP EXPO, November, 2014
		IIM Ahmadabad	Training on Succeeding in Corporate World, 2014 and 2015
		CII	Lead Speaker at 'Young Indians Annual Meet', Chandigarh, August, 2014
2.	Dr. O.P. Monga	CIIPP, CIL Building, Panjab University, Chandigarh	Intellectual Property Rights Filing Procedures, Patentability Search and Patent Drafting, September 7, 2013
		CSK Agricultural University, Palampur	Regional Workshop on Restructuring of Syllabi of Sociology for Undergraduate Classes and introduction of Credit Based and Choice Based System under RUSA, May, 14-15, 2013
		Kumaon University and ICSSR New Delhi, at nainital	National Conference on Tourism and Sustainable Development in Himalayas, 11-12 November, 2014
3.	Dr. Kesari	Sri Lanka	World Biodiversity Congress-2014, 24-27 th November, 2014
		STARs Forum, Pune, Maharashtra	Annual National Conference on 'Livelihood Opportunities in Rural Areas' 27-28 th December, 2014
4.	Dr. Narinder Verma	PHD CHAMBER, New Delhi.	Citation Analysis, Impact Factor, Patents & Copy Rights for Maximizing Research Impact, 5 th May, 2014

S. No.	Name of the Faculty	Institution/Industry/Country Visited	Purpose of the Visit
5.	Devesh Kumar	Jaipuria Institute of Management, Ghaziabad	Corporate Summit on “Talent Management: Building Managerial Competitiveness”, Nov. 29, 2014
		NITTTR, Chandigarh, India	Conference on Global Trends in Entrepreneurship” on Nov. 28, 2014
		RGPV, Bhopal, India	International Conference on Cloud, Big Data and Trust’, November 13-15, 2013
		Infosys, Chandigarh	Workshop on ‘Business Intelligence: An Industry Perspective’, Feb. 24, 2012
6.	Varsha Patil	ICSI	Regional Conference of Company Secretaries of India, Kufri, Shimla June 2013.
7.	Prachi Kapil	Jawaharlal Nehru University, Delhi	International Conference on ‘Emerging trends in Engineering, Science, Management and its applications’, March 1, 2015
		CRRID, Sec-19 A, Chandigarh	10 days Research Methodology Program for Ph.D students, sponsored by ICSSR. March 18-27, 2015
		APG Shimla University, Shimla	National Seminar on FDI: Issues and Challenges, 2013
8.	Nitin Gupta	GENPACT	Train the Trainer Program, March, 2011
		PHD CCI, Baddi, Solan	Conference on CSR, 2012

26. Faculty serving in

a) National committees

Table MT12: National Committee Membership

Name of the Faculty	National Committee Membership
Prof. Atul Khosla (Selected)	<ul style="list-style-type: none"> ○ Independent Director, Gabriel India Ltd. ○ Member, Advisory Board, Ankur Capital Mumbai ○ Independent Director, Innohive India
Prof. O.P. Monga	<ul style="list-style-type: none"> ○ Consultant Life Member: Palaeo Research Society, Ghumarwin, District Bilaspur, Himachal Pradesh, 2012 ○ Steering Committee Tobacco Control, Government of Himachal Pradesh, Shimla. ○ Honorary Member and member Advisory Board of Society, Kalp Foundation: Knowledge Entrepreneurs, Shimla

b) International committees:

- Prof. Atul Khosla, Global Partner & Advisor, Oliver Wyman PLC.

c) Editorial Boards:

Table MT13: Editorial Board Membership

Name of the Faculty	Editorial Board Membership
Prof. O.P. Monga	<ul style="list-style-type: none">• Editorial Board Member, Journal Club for Management Studies : An International Peer Reviewed Journal• International Journal of Emerging Business Issues (IJEI) at Sri Venkateswara Institute of Information Technology & Management (SVITM), Coimbatore, Tamil Nadu• Editorial Board Member- International Association of Scientific Innovation and Research, USA.• Honorary International Editorial Advisory Board Member, International Journal of Entrepreneurship and Small & Medium Enterprises (IJESMES) , Lazimpat, Kathmandu, Nepal

d) any other (please specify):

Table MT14: Other Memberships

Name of the Faculty	National Committee Membership
Prof. O.P. Monga	<ul style="list-style-type: none">• Indian Sociological Society, New Delhi• Indian Society on Population Education, New Delhi• Association of Gerontology of India, Varanasi, (U.P.)• Nature Conservators: An International Social and Scientific Organization, Muzaffar Nagar (U.P.), India• Community Psychology Association of India, Department of Applied Psychology Purvanchal University, Jaunpur – 222 002 (U.P.)• North Western Indian Sociological Association, Chandigarh. Member EC, NWISA, 2004

Name of the Faculty	National Committee Membership
Prof. Y.S. Negi	<ul style="list-style-type: none"> • Life member, Indian Society of Agricultural Economics, Mumbai • Life member, Indian Society of Agricultural, Nagpur • Life member, Indian Society of Tree Scientists, Solan • Life member, Indian Society of Agricultural Development and Policy, Ludhiana • Life member, National Environment Science Academy, New Delhi
Dr. Kesari	<ul style="list-style-type: none"> • Life Member, The Indian Society for Ecological Economics (INSEE), Dehli.
Varsha Patil	<ul style="list-style-type: none"> • Associate Member, Institute of Company Secretaries of India (ICSI)

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

School of Business Management & Liberal Arts strives to achieve academic excellence through the policy of enhancing the teaching and research skills of the faculty. The School has been regularly organizing various faculty development programs to academically recharge and rejuvenate the teachers. Eminent academicians, researchers and industry experts are invited as resource persons in such programs. Some of these are listed as under:

Table MT15: Faculty Development Programs

S. No.	Topic	Year	Resource Person/s
1.	Transactional Analysis and Communication Skills	2015	1. Mr. Sanjay Sharma, Senior Manager, Tata Steel 2. Ms. Sangeeta Sharma, Business Training Ideas
2.	Financial Literacy	2015	1. Mr. Mirodul Rastogi, Assistant General Manager, SEBI 2. Mr. Raman Kalra, Assistant Manager, NSE
3.	Thesis & Paper Writing	2015	Dr. Klaus von Gadow, Germany

S. No.	Topic	Year	Resource Person/s
4.	Personality Development	2015	Prof. B. L. Dubey, University of Alaska, and Director SIS, Anchorage, USA
5.	Metacognition	2014	Maj. Atul Mehta, HR Power House, Noida
6.	Relevance of Human Resource in Organizational Image	2014	Mr. Pradeep Mukherjee, CEO Mercer, India
7.	Online Education	2014	Ms. Florence Martin, Associate Professor, University of North Carolina, USA
8.	Spiritual Leadership-I & II	2014	Mr. Rajendra Abhange, Senior Director Technology, Gabriel India
9.	Curriculum Development	2014	Ms. Pooja Gupta, Consultant Higher Education
10.	Sampling Error and Analysis Techniques	2013	Prof. Kulvinder Singh, Punjabi University, Patiala Prof. S.S. Narta, H.P. University, Shimla
11.	Research Writing	2013	Ms. Andrea Wright, Brown University, USA
12.	Case Study Methodology	2013	Prof. Ashley Braganza, Brunel University, UK.
13.	Case Teaching	2012	Ms. Ashoo Khosla, Founder & Managing Partner DealNetwork LLC, Abu Dhabi
14.	Business Plan Training	2012	Mr. Sridhar Srinivasan, Ex MD Citibank, London
15.	Marketing & Branding	2012	Ms. Aarti Nihlani, Manager Oliver Wyman
16.	Teaching Pedagogy	2011	Mr. Arjun Singh, Ex MD Hewitt
17.	Workshop on Excel	2011	Mr. Parijat Banerjee, Engagement Manager, Oliver Wyman, Mumbai
18.	Business Communication Skills	2011	1. Ms. Aarti Nihlani, Senior Manager, Oliver Wyman, Mumbai 2. Mr. Prateek Ved, Brand Manager, Hindustan UNilever Limited

In addition to the above mentioned faculty development programs, faculty members are encouraged to attend and present their research work in Academic Staff Development Programs, workshops, seminars and conferences organized by other organizations/institutes as well. Details of such programs attended by the faculty are as under:

Table MT16: Academic Staff Programs/Conferences/Workshops Attended outside the university

S. No.	Name of the Faculty	Program	Organizer
1.	Dr. Narinder Verma	Citation Analysis, Impact Factor, Patents & Copy Rights for Maximizing Research Impact, 5 th May, 2014	PHD CHAMBER, New Delhi.
2.	Mr. Devesh Kumar	Faculty Development Program (FDP) on Advance Research Methodology and Data Analytical Tools on July 10 -14, 2013	Jaipuria Institute of Management, Ghaziabad(India)
3.	Ms. Prachi Kapil	10 days Research Methodology Program for Ph.D students, sponsored by ICSSR. March 18-27, 2015	CRRID, Sec-19 A, Chandigarh

28. Student projects

•percentage of students who have done in-house projects including inter-departmental projects 100%

Student projects are a mandatory part of the course curriculum of each program offered by the School. These projects educate the students to apply the knowledge of management studies in the corporate world and enhance their research, problem solving and report writing skills. The broad thrust areas include marketing, finance, human resource, economics, information technology, pharma management and biotechnology etc. Such projects are generally based on market/customer surveys, data collection, analysis,

secondary research and report writing under the guidance of faculty mentor. More than 300 MBA and 60 B. Com (Hons) & BBA projects have been completed till date.

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

- Summer internship spread over eight weeks is a mandatory part of MBA curriculum. Students are placed with reputed industries/companies for their summer internships. They are assigned a project topic to be completed mainly under the guidance of industry mentor. Project report is finally submitted and presented in the School of Business Management & Liberal Arts. More than 500 MBA projects have been completed till date with leading Global and Indian companies like Oliver Wyman, GENPACT, ICICI Prudential, Kotak Group, ICICI Securities, Orbit Biotech, World Gold Council (WGC), Mondelez, and Agilent etc.
- Several students of MBA and UG programs also voluntarily undertake projects in collaboration with industry and other institutions.
- Starting 2015-16, summer internship is mandatory for all UG students.

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

•Faculty

Faculty members who received recognition in different fields have been listed below:

- Prof. Atul Khosla- awarded with the 'Visionary Leader Award' for Excellence in Education at the 3rd Higher Education Summit by CAREER OPTIONS at New Delhi, 2014.
- Prof. Atul Khosla- invited to join the Board as Independent Director, Gabriel India Ltd.
- Prof. Atul Khosla- elected Global Partner of Oliver Wyman PLC.
- Prof. Atul Khosla- invited by the Ministry of Finance, GoI to present to the Finance Minister of India his perspectives on regulatory transformation (SEBI) in India.
- Ms. Gaytri Kanwer got a Letter of Appreciation for delivering a talk on 'Oral and Written Communication' in a short Term Program on "Communication Skills for Effective Curriculum Implementation" organized by National Institute of Technical Teachers Training &

Research, Chandigarh, from 9-11th June, 2015 held at Government Polytechnic for Women, Kandaghat, Solan.

- Ms. Prachi Kapil got a Letter of Appreciation for delivering a talk on 'Resume Writing' in a short Term Program on "Communication Skills for Effective Curriculum Implementation" organized by National Institute of Technical Teachers Training & Research, Chandigarh, from 9-11th June, 2015 held at Government Polytechnic for Women, Kandaghat, Solan.

•**Doctoral / post doctoral fellows**

Nil

•**Students**

Students of School of Business Management & Liberal Arts have been actively participating in various cultural and sports events and fests organized by different organizations/institutes. Recognitions received by the students include:

- **Award:** School MBA team Winner in 'Stock MIND 3' College Round by ICICI direct.
- **Scholarships:** Akanksha Puri (B. Com. Hons, 2010-13), Heena Slodhiya (B. Com. Hons, 2011-14) and Neha Basra (MBA, 2012-14) were awarded merit scholarship under Indira Gandhi *Chatravriti Utkrishtha Yojna* by the Government of Himachal Pradesh.
- **Medals:** Students won medals in various sports events organized by the University and outside the University. These include:
 - Alisha Sharma and Kusum Verma won Gold Medal in Inter-University Table Tennis Championship held at Jaypee University, Solan (2013).
 - Ankit Dabral & Maneesh Sharma won Bronze Medal in Inter-University Table Tennis Championship held at Jaypee University, Solan (2013).
 - Alisha Sharma and Kusum Verma won Gold Medal in Inter-University Table Tennis Championship held at Chitkara University, Chandigarh (2013).
 - Ankit Dabral won Gold Medal in Inter-University Table Tennis Championship held at Shoolini University, Solan (2013).
 - Ankit Dabral and Maneesh Sharma won Gold Medal in Inter-School Table Tennis (Doubles) Championship, at Shoolini University, Solan (2013).

- Ankit Dabral and Maneesh Sharma won Bronze Medal in Inter-School Table Tennis (Doubles) Championship, at Shoolini University, Solan (2014).
- Ankit Dabral won Silver Medal in Inter-School Table Tennis (Singles) Championship, at Shoolini University, Solan (2014).
- Maneesh Sharma won Bronze Medal in Inter-School Table Tennis (Singles) Championship, at Shoolini University, Solan (2014).

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

The School has been organizing workshops on different themes for the benefit of faculty and students. Eminent speakers are invited as resource persons to exchange and share their views with the participants. All workshops/seminars organized by the School are funded by the University:

Table MT17: Workshops Organized by the School

S. No.	Topic	External Resource Person(s)
1.	Regional Seminar on Impact of Investor Education on Indian Economy 18 th June, 2015	1. Mr. Prashant Saran, Whole Time Member (WTM), SEBI. 2. Mr. Amit Pradhan, SEBI. 3. Mrs. Renu Bhandar, NSE.
2.	Financial Literacy, 19 th May, 2015	1. Mr. Mirodul Rastogi, Asst. General Manager, NSE. 2. Mr. Raman Kalra, Assistant Manager, SEBI.
3.	Myers-Briggs Personality Type Indicators (MBTI), 23 rd March, 2015	Prof. B. L. Dubey, University of Alaska, and Director SIS, Anchorage, USA.
4.	Personality Development and Voice Modulation' 5 th February, 2014	Ms. Vandana Vadehra, Singer, Composer and Performer, Mumbai.
5.	Finance and Accounting, 24-25 th February, 2014	Prof. S.S. Narta, H.P. University, Shimla.
6.	Optimization of Sampling Errors, 2-3 rd December, 2013	1. Prof. S.S. Narta, H.P. University, Shimla. 2. Prof. Kulvinder Singh, Punjabi University, Patiala.
7.	Statistical Package for Social Sciences, 7 th -8 th June, 2013	Dr. Arunesh Garg, Gyan Jyoti Institute of Management, Mohali.
8.	Research Methodology, 15 th -16 th February, 2013	1. Prof. Kulvinder Singh, Punjabi University, Patiala. 2. Prof. Subhash Davar, Dean Faculty of Commerce, Kurukshetra University. 3. Prof. Narender Singh, Faculty of Commerce, Kurukshetra University.
9.	Research Writing, 7 th August, 2013	Ms Andrea Wright, Brown University, USA
10.	Certification in Banking Technology- a practical training course on Banking Technology, 23-29 th October, 2010	Mr. Makarand Tilak, IDBI Intech Ltd.

31. Code of ethics for research followed by the departments:

The School has adopted the UNESCO code of conduct for social sciences research. It applies to all aspects of social science research including data collection, recording, citing, and reporting to the retention of research material.

32. Student profile Program-wise:

Program wise student profile has been given below:

Table MT18: Program Wise Student Profile

Year	Name of the Program (refer to question no. 4)	Applications received	Selected		Pass Percentage	
			Male	Female	Male	Female
2009-10	MBA	23	13	08	100	100
	Ph.D	02	-	1	-	100
2010-11	B. Com (Hons)	20	10	10	91	100
	MBA	71	46	22	88	96
	Ph.D	22	8	7	11	-
2011-12	B. Com (Hons)	21	7	10	86	100
	MBA	81	45	25	84	86
	Ph.D	08	1	2	-	-
2012-13	B. Com (Hons)	32	14	16	-	-
	MBA	105	67	29	99	100
	Ph.D	08	3	2	-	-
2013-14	B. Com (Hons)	64	39	18	-	-
	MBA	147	90	47	-	-
	Ph.D	06	2	1	-	-
2014-15	B. Com (Hons)	74	45	26	-	-
	BBA	17	9	5	-	-
	MBA	92	49	14	-	-
	Ph.D	-	-	-	-	-
B.A. (Hons) Economics has been introduced from 2015-16.						

33. Diversity of students

Spectrum of students in terms of diversity is tabulated below:

Table MT19: Diversity of Students

Year	Name of the Program (refer to question no. 4)	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
2009-10	MBA	-	47	53	-
	Ph.D	-	-	100	-
2010-11	B. Com (Hons)	-	100	-	-
	MBA	-	51	49	-
	Ph.D	-	25	75	-
2011-12	B. Com (Hons)	-	79	21	-
	MBA	-	75	25	-
	Ph.D	-	20	80	-
2012-13	B. Com (Hons)	-	78	22	-
	MBA	-	74	26	-
	Ph.D	-	83	17	-
2013-14	B. Com (Hons)		81	19	-
	MBA	8	62	30	-
	Ph.D	-	75	25	-
2014-15	BBA	-	73	27	-
	B. Com (Hons)	-	88	12	-
	MBA	4	62	34	-
	Ph.D	-	-	-	-

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

School's curriculum has been designed for employment outcomes for success in both the corporate sector and competitive examinations. E.g. special emphasis is given on aptitude and comprehension, English and communication skills. As a result, students have been successful in clearing various competitive examinations:

Table MT20: Number of Students Who Cleared Competitive Examinations

S. No.	Examination Cleared	No. of Students
1.	UGC-NET/JRF	04
2.	Probationary Officer	07
3.	Company Secretary	04
4.	Banking & Insurance	11
Details of Competitive Examinations Cleared		
S. No.	Name	Examination Cleared
1	Payal Thakur	JRF/ UGC-NET
2	Shivali Rathor	UGC-NET
3	Kamal Kant Vashist	UGC-NET
4	Sahil Nanda	UGC-NET
5	Himanshu Vashisht	Probationary Officer
6	Dinesh Verma	Probationary Officer
7	Dharmender Singh	Probationary Officer
8	Gagan Singh	Probationary Officer
9	Anuj Sharma	Probationary Officer
10	Dilawar Singh	Probationary Officer
11	ANil Sharma	Probationary Officer
12	Shradha Bahsin	Company Secretary
13	Ankit Dabral	Company Secretary
14	Nidhi Bhardwaj	Company Secretary
15	Manisha Kansra	Company Secretary
16	Neha Thakur	Banking
17	Vishal Chamyal	Banking
18	Lalit Gautam	Banking
19	Surjeet Singh	Banking
20	Gajendra Vardhan	Banking
21	Vinod Kumar	Banking
22	Ashish Katna	Banking
23	Pravesh Kumar Thakur	Banking
24	Ashwani Kumar	Banking
25	Swati Gupta	Banking & Insurance
26	Amit Bhatt	Banking

35. Student progression

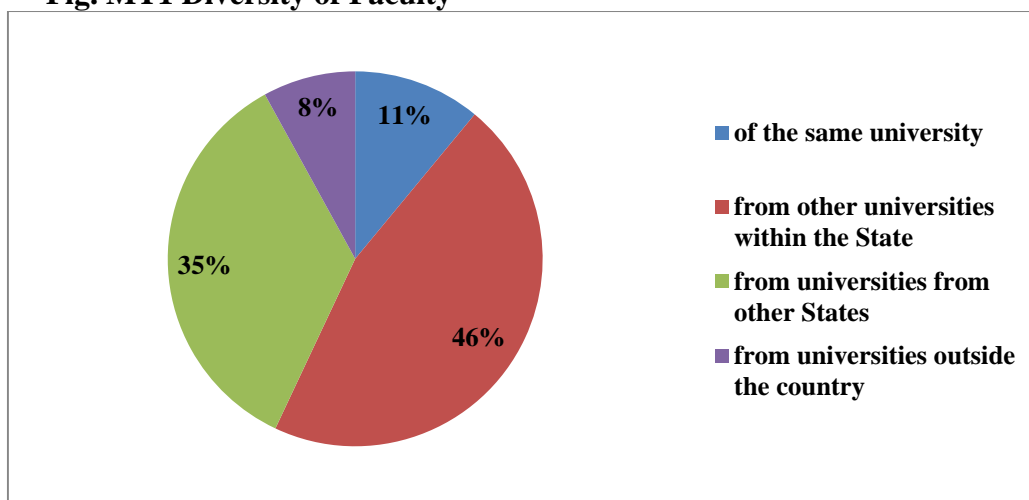
Table MT21: Student Progression within the University

Student progression	Percentage against enrolled				
	2011	2012	2013	2014	2015
UG to PG	-	-	58	18	-
PG to M.Phil.	-	-	-	-	-
PG to Ph.D.	-	-	-	-	-
Ph.D. to Post-Doctoral	-	-	-	-	-
Employed					
Campus Selection	43	70	77	69	68
Other than Campus	48	19	16	16	06
Entrepreneurs	24 entrepreneurs till date				

36. Diversity of staff

School of Business Management & Liberal Arts has faculty with diverse background having done their degrees from reputed national and international Universities/Institutes.

Fig. MT1 Diversity of Faculty



In addition, the School has developed a faculty team with diversity from both academia and industry.

37. Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period: 01 (One)

Dr. Kuldeep C. Rojhe completed his Ph.D in Marketing from Himachal Pradesh University, Shimla in 2014.

38. Present details of departmental infrastructural facilities with regard to

a) Library:

Central library of the University is fully digitized and acts as the hub of the University's Knowledge Centre, which aims to supplement both formal and 'out-of-classroom' learning through the Learning Management System (LMS) and Knowledge Management System (KMS) and also to extend the reach of Shoolini University's online platform (eUniv). Magazines and Newspapers are provided all over to encourage the habit of reading among students.

In addition to the central library, each school has its own library, which is linked to the Main Library. Conceptually, they are in the form of a 'virtual' library, with minimum physical books and journals. The central library has also subscribed to more than 1.0 lac of e-books and around nine thousand e-journals pertaining to different fields of study. Following books and journals are available for management students and faculty in the library:

- Total Books available: 6527 + ebooks
- Reference Books available: 542 + ebooks
- Journals: 17 + ejournals

b) Internet facilities for staff and students: Free internet facility is available to all staff and students through the University's extensive Wi-Fi network. In addition, each faculty cabin and lecture hall has LAN connectivity.

c) Total number of class rooms: There are six dedicated lecture halls (including two e-labs) well equipped with audio visual aids. Each hall has wi-fi and LAN connectivity. Display boards are available where time table and other necessary information and notices can be displayed. In addition, the School leverages infrastructure from other Schools of the University and central facilities as needed.

d) Class rooms with ICT facility 100%

Projectors with display screen along with white boards are installed in each lecture hall. There is an arrangement of portable projector also.

e) Students' laboratories

Various labs catering to the teaching learning needs of the students include:

1. Information Technology Lab: The School has one IT lab with internet facility. Students get a practical demonstration of softwares and simulations such as the use of tally and balance sheet preparation etc.. Students can also access all online learning resources in the IT lab.

2. Language Lab: Language Lab is fully functional in the Knowledge Center to promote 'self-learning,' and is over and above formal language classes to prepare them for tests like ILETS, TOEFL etc.

3. E-Labs: There are two e-labs with a capacity of 300 students. Fully air conditioned labs are well equipped with the facility of video tele conferencing and audio visual aids.

4. Meditation Centre: Meditation centre in the School provides the environment of serenity and mental relaxation to the students.

5. Skill Centre: Skill centre has been developed to enhance soft and hard skills of the students. The centre caters to the needs of slow learners and of the students who are poor in communication skills. In addition, it focuses on overall personality enhancement of the students across the University. This works in conjunction with Language Lab.

f) Research laboratories

Analytical Lab: Analytical lab located in the Knowledge Center is being extensively utilized for statistical analysis by students and research scholars.

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

- a) **from the host /university:** Nil
- b) **from other institutions/universities:**

Table MT22: List of Doctoral Students

S. No.	Ph.D Students	Topic
1.	Rohit Kumar	An Analysis of Financial Performance of District Central Cooperative Banking in Haryana
2.	Nitin Gupta	A Comparative Study on the Performance of Private and Public Sector Banks.
3.	Amita Bhandari	Effects of Foreign Bank Entry on the Performance of Domestic Banks in India
4.	Rekha Rathore	Impact of Employees Stock Options Plan on Productivity Performance of Information Technology and Pharmaceutical Industries in India
5.	Saurbhya Sarwal	The Impact of Corporate Governance and Disclosure Practices on Retail Investor Participation- A Study on Index listed entities in India
6.	Manoj Kumar	Yield Optimization for Independent Hotels
7.	Sandhya Dhiman	The Impact of Transformational and Transactional Leadership Style on Organizational Effectiveness at Higher Educational Institutions in Jammu and Kashmir
8.	Swati Chaudhary	Effects of Cultural Workforce Diversity on Organizational Performance
9.	Sneha Chaudhary	A Historical Analysis of Indian Tea Industry
10.	Charu Marwaha	Supply Chain Management of Fruit Processing Industry in Himachal Pradesh
11.	Subhash Chander	Customer Relationship Management in General Insurance Services in Public and Private Sector- A Case Study of Haryana State
12.	Aditi Chandel	Influence of Brand Personality Dimensions on Consumer Preference and Marketing Strategies of Selected Sportswear Brands: An Empirical Study of College and University Students in Northern India
13.	Lekh Raj	A Study on Service Quality and Customer Satisfaction in Paid Direct To Home Service Providers in Himachal Pradesh

S. No.	Ph.D Students	Topic
14.	Ravi Kumar	Consumer Attitude and Satisfaction with counterfeit Cosmetic products: A study in Himachal Pradesh
15.	Vikas	Total Quality Management Adoption and Performance in Pharmaceutical Industry of Himachal Pradesh
16.	Anish Kaushal	Study of Parent Child Purchase Relationship in Selected States of North India
17.	Pooja Verma	Quality of Work Life with Special Reference to Female Teachers in Universities of Himachal Pradesh
18.	Kamal Kant Vashist	Critical Success Factors of Network Marketing: A Case Study of AMWAY
19.	Rozy Dhanta	Crop Diversification in Himachal Pradesh: Role of Small Farmers
20.	Narinder Verma	Modeling of Stock Market Volatility in India
21.	Harjinder Kaur	A Study on Consumer's Attitude towards Online Grocery Shopping in Selected States of Northern India
22.	Shivendra Gupta	An Analysis of Non-Performing Assets of Private and Public Sector Banks
23.	Ajay Dogra	An Analysis of Cooperative Banking in Himachal Pradesh

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

The University has initiated significant number of scholarships to encourage students towards achieving excellence in education and also removing the barriers to higher education for students from low income groups. 42 students of the school were awarded the scholarship under different categories during the year 2014-15.

Table MT23: Program Wise List of Students Getting Financial Assistance

S. No.	Name of the Student	Program
1	Kavita Thakur	B.Com
2	Gaurav Rawat	B.Com
3	Sanjay Kumar	B.Com

S. No.	Name of the Student	Program
4	Neha Pundir	B.Com
5	Shruti Singh	B.Com
6	Kavita Thakur	B.Com
7	Prajwal Gupta	B.Com
8	Gurpreet Singh	B.Com
9	Abhay Negi	B.Com
10	Tarini Parmar	B.Com
11	Dinesh kumar	B.Com
12	Krishan Kant	B.com
13	Binni Mittal	B.Com
14	Stanzin Tundup	B.Com
15	Priyanka Bhardwaj	B.Com
16	Anjali Bansal	BBA
17	Devam Jaiswal	BBA
18	Shilpa Sharma	MBA
19	Beenu Sethi	MBA
20	Tanuja Sabharwal	MBA
21	Bharat Bhushan Verma	MBA
22	Sahil Chopra	MBA
23	Chander Shekhar	MBA
24	Aakanksha Dabral	MBA
25	Amit Sharma	MBA
26	Stuti Ghanvata	MBA
27	Narinder Sharma	MBA
28	Rohit Chaudhary	MBA
29	Ankita Gurung	MBA
30	Arun Sharma	MBA
31	Shubham Jaiswal	MBA
32	Sumit Thakur	MBA
33	Vineet Chauhan	MBA
34	Sonali Chauhan	MBA
35	Himanshu Chauhan	MBA
36	Rajesh Gautam	MBA
37	Harleen Wazir	MBA
38	Sudhanshu Kapil	MBA
39	Pushpender Kanwar	MBA
40	Sumit Thakur	MBA
41	Zakhir hussain	MBA
42	Vivek	MBA

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

Yes, need assessment exercises are undertaken before launching any new program. Feedback from stakeholders including recruiters, faculty, industry experts, alumni and students are collected during meetings of Academic Committee and Board of Studies, Alumni meets, Placement Week and workshops/guest lectures.

As an example, after the success of B. Com (Hons) program and high demand for smarter, better and innovative skilled undergraduates by the corporate, new programs viz. BBA in 2014 and B.A. (Hons) Economics in 2015. Another example is the initiation of MBA in BPM which was designed in consultation with GENPACT.

42. Does the department obtain feedback from

a. faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

Yes, feedback of the faculty is regularly taken on curriculum development and teaching-learning evaluation which has widely helped in development of outcome driven curriculum. The Academic Committee of the School has been constituted as per the directions of Academic Council which includes all the faculty members. This Committee under the chairmanship of Dean meets periodically to discuss the curriculum, teaching-learning-evaluation and research issues. In addition, all faculty members being part of Board of Studies give their feedback on teaching-learning-evaluation which is fully incorporated and implemented in the subsequent semester. Following initiatives have been taken in the School as per the recommendations of the Academic Committee and Board of Studies:

- New programs BBA and B.A. Hons in Economics introduced.
- New courses like persona enhancement, written & verbal communications, Drafting, Registrations and Corporate Filings, Aptitude Development, etc introduced.
- Improved pedagogy- case study method and online study material through LMS.
- Outcome driven curriculum have been developed wherein vision, objectives, learning and skill outcomes for each course are clearly defined.

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

Yes, students' feedback is taken at the closing of every semester. A well structured format is used for collecting students' feedback regarding the faculty teaching & evaluation, curriculum etc. Students' feedback is taken as the basis for annual faculty performance appraisals, while introducing a new course/program, development and redesigning of curriculum at School level and for development of the University at large. Courses like persona enhancement, written and verbal communications and aptitude development have been introduced as per students' feedback.

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

Yes, the School takes Alumni and Employers' feedback on the Programs and curriculum offered. Employers' feedback is taken during their visits to the campus for placements, whereas the alumni feedback is collected during the 'Alumni Meets'. Alumni are frequently invited for an interaction with the students during 'SPRINT' program and for their feedback on the academic Programs and courses which is incorporated while revising the curriculum and courses.

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

Being new, the School does not have any "distinguished alumni".

However, leading Indian and International companies have hired MBA and B. Com (Hons) students since inception. Some of the key recruiters have been GENPACT, Axis Bank, HDFC, ICICI group, Marsh India, Pepsi Co., City Bank, Mercer Johnson & Johnson, Godrej, Oberoi Hotels, P&G, Vardhman and many more.

Few of the School's Alumni performing well in industry are as under:

Table MT24: List of Alumni Working with Leading Organizations

S. No.	Name of Student	Company	Designation
1.	Birbal	GENPACT	Assistant Manager- Gernal Accounting (Record to Report)
2.	Supreet Kaur	Marsh India	Assistant Manager
3.	Kiran Pal	C-Step	HR Associate

S. No.	Name of Student	Company	Designation
4.	ANil Kumar Minhas	Abbacus Offshore	Executive Client Relation
5.	Shubadip Dan	ICICI Prudential	Senior Account Officer
6.	Rahul Verma	GENPACT	Assistant Manager-Analytics (Finance Planning and Analysis)
7.	Udit Gautam	Mercer	Senior Analyst
8.	Abhishek Ranotra	Pepsi Co	Customer Executive
9.	Tarun Kaul	ICICI Securities	Relationship Manager
10.	Manisha Parsheera	ICICI Prudential	Manager

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

Frequent visits by expert guest faculty from industry and eminent academicians lend exposure to the students, opening up a multitude of avenues for them to know more about the latest management practices. School of Business Management & Liberal Arts has been organizing workshops on various themes to enhance the knowledge and exposure to current management issues. Some of such workshops and eminent speakers have been enumerated as under:

Table MT25: Select Workshops/Seminar Organized for Students

S. No.	Topic/Theme	Expert
1.	<i>Lakshay</i> - Goal Setting	Mr. Bobby D'Souza
2.	Myers-Briggs Personality Type Indicators (MBTI, 23 rd March, 2015	Prof. B. L. Dubey, University of Alaska, and Director SIS, Anchorage, USA.
3.	Pre-Placement SPRINT for MBA students (Annually), 21 st January-4 th February, 21-26 th February & 26 th February-6 th March, 2015	1. Industry Experts 2. Experienced Academicians 3. Alumni
4.	Career Options for B. Com (Hons) & BBA graduates	Mr. Jadhoojit Das, Executive Director, HR Head, ICICI Prudential
5.	SPRINT on Soft and Accounting Skills for undergraduate students, 24-26 th November, 2014	1. Mrs. Poonam Nanda, Director, SPRINT, Shoolini University 2. Mr. Chander Mohan Gupta, Assistant Professor Shoolini University 3. Mr Shivendra Gupta, Assistant Professor Shoolini University

S. No.	Topic/Theme	Expert
6.	SPRINT on Business Plan for MBA 2 nd Year Students, 7-11 th October, 2014	1. Prof. Atul Khosla, Dean Faculty of Management Sciences 2. Industry Experts 3. Ms. Poonam Nanda, Director, SPRINT, Shoolini University
7.	MBA Induction SPRINT, 12-23 rd August, 2014	1. Prof. Atul Khosla, Dean Faculty of Management Sciences 2. Dr. Kesari, Faculty of Management Sciences 3. Ms. Poonam Nanda, Director, SPRINT, Shoolini University
	Induction SPRINT for BBA/B.Com (Hons), 23 rd -25 th July, 2014	1. Prof. Atul Khosla, Dean Faculty of Management Sciences 2. Dr. Saibal Basu, Faculty of Management Sciences 3. Ms. Poonam Nanda, Director, SPRINT, Shoolini University
8.	Finance and Accounting, 24-25 th February, 2014	Prof. S.S. Narta, H.P University, Shimla
9.	Personality Development and Voice Modulation' 5 th February, 2014	Ms. Vandana Vadehra, Singer, Composer and Performer, Mumbai.
10.	Resume Building, February, 2014	1. Mrs. Poonam Nanda, Director SPRINT, Shoolini University 2. Dr. Kuldeep Rojhe, Associate Professor, Shoolini University 3. Mr. Munish Prabhakar, Director Placement, Shoolini University.
11.	Self Confidence and Goal Setting, 2014	Mr. Bobby D'Souza, Motivational Trainer
12.	SPRINT for MBA-I, 24-28 th February, 2014	1. Prof. Atul Khosla, Dean Faculty of Management Sciences 2. Mr. Devesh Kumar, Faculty of Management Sciences 3. Ms. Poonam Nanda, Director, SPRINT, Shoolini University
13.	Pre-Placement SPRINT for MBA, 16-31 st January, 2014	1. Mr. Munish Sapra, ISH Mohali 2. Mr. Arvind Nanda, Faculty of Engineering and Technology 3. Ms. Poonam Nanda, Director, SPRINT, Shoolini University
14.	SPRINT for MBA 2 nd Year on Technical Skills (HR. Marketing, Accounting etc.), 2-12 th December, 2013	1. Prof. Atul Khosla, Dean Faculty of Management Sciences 2. Mr. Kuldeep Rojhe, Faculty of Management Sciences 3. Ms. Poonam Nanda, Director, SPRINT, Shoolini University

S. No.	Topic/Theme	Expert
15.	SPRINT for MBA 2 nd Year on Technical Skills (HR. Marketing, Accounting etc.), 3-12 th October, 2013	1. Prof. Atul Khosla, Dean Faculty of Management Sciences 2. Mr. Kuldeep Rojhe, Faculty of Management Sciences 3. Dr. Kesari, Faculty of Management Sciences 4. Ms. Pooja Verma, Faculty of Management Sciences
16.	SPRINT for MBA 2 nd Year, 19-30 th August, 2013	1. Mr. Kamlesh Vyas, Director FISB Delhi , ex CEO ACME Associate Director at EY Gurgaon India 2. Prof. Atul Khosla, Dean Faculty of Management Sciences 3. Ms. Pooja Verma, Faculty of Management Sciences
17.	MBA Induction SPRINT, 6-8 th August, 2013	1. Mr. Ashish Khosla, Vice-President, UNB Abu Dhabi 2. Prof. Atul Khosla, Dean Faculty of Management Sciences 3. Mr. Vishal Anand, MD Anand Toyota
18.	Effective Communication, 2013	Ms Andrea Wright, Brown University, USA
19.	Optimization of Sampling Errors”, 2-3 rd December, 2013	1. Prof. Kulvinder Singh, Punjabi University, Patiala 2. Prof. S.S. Narta, H.P. University, Shimla
20.	Training on SPSS, 7 th -8 th June, 2013	Dr. Arunesh Garg, Gyan Jyoti Institute of Mangement, Mohali
21.	SPRINT on Soft Skills for B. Com. (Hons)”, 22-24 th April, 2013	Mr. Bobby D’Souza, Motivational Trainer
22.	Research Methodology, 15 th -16 th February, 2013	1. Prof. Kulvinder Singh, Punjabi University, Patiala 2. Prof. Subhash Davar, Dean Faculty of Commerce, Kurukshetra University 3. Prof. Narender Singh, Faculty of Commerce, Kurukshetra University
23.	Basics of Research”, 11 th September, 2012	Dr. Kesari, Shoolini University, Solan
24.	Pre-Placement SPRINT, 22-28 th February, 2013	1. Mr. Sheetal Behl, MD GrowX 2. Prof. Atul Khosla, Dean Faculty of Management Sciences 3. Mr. Ajay Narula, Coordinator SPRINT
25.	SPRINT MBA PROGRAM”, 4 th -18 th January, 2012	1. Mr. Parijat Banerjee, Engagement Manager, Oliver Wyman, Mumbai 2. Mr. Gaurav Mehta, Strategy Consultant at Rroland & Berger, Hong Kong

School of Business Management & Liberal Arts has a score of mentors visiting the campus to provide intellectual inputs. Over 20 national and international corporate leaders are a part of this unique initiative of the School visiting the campus and interacting with the students on different forums like Guru Lecture Series- wherein eminent personalities from all walks of life are invited to the campus to speak on topics of broad interest, providing a platform for intellectual discourse and lifelong learning, workshops and training sessions, special lectures etc. To name a few, Lieutenant General Baljit Jaswal, Major General Ajay Chaturvedi (Retired) and Mr Vivek Atray, Deputy Commissioner of Panchkula recently visited the campus and delivered talks on ‘Proactive Leadership’, ‘Overseas Success Stories of Indian Students’ and ‘Bouncing Back in Life’ respectively. List of other guest/special lectures delivered by the eminent experts from academia and industry has been given below:

Table MT26: Details of Special Lectures Delivered

S.No.	Expert	Designation	Topic
1.	Ashish Khosla	Vice-President, UNB Abu Dhabi	Marketing Management/Advertising
2.	Vishal Anand	Managing Director, Anand Toyota Group	How to become a successful Entrepreneur
3.	Andrea Wright	Brown University, USA	Effective Communication Empathy
4.	Nikhil Barshikar	M.D. Imarticus Learning	Campus to Corporate
5.	Rajendra Abhange	Senior Director Technology, Gabriel India	Latest innovations in Auto Industry
6.	Sona Narang	Director Hayes Institute of Hospitality	“Mujh me hai dum” Grooming & etiquettes
7.	Justice N.K. Sodhi	Former Chief Justice of Karnataka & Kerala High Court	Legal Aspects of Business
8.	Rajinder Sharma	Director Corporate Affairs and General Counsel- South Asia Du Pont India	Work ethics
9.	Bobby D'souza	Motivational Trainer	Painting the picture of your life “Personal goal setting”

S.No.	Expert	Designation	Topic
10.	Gaurav Mehta	Strategy Consultant at Rroland & Berger, Hong Kong	Market Securities
11.	Arun Bhardwaj	International Motivational Speaker	Managing your time
12.	Nidhi Uppal	Relationship Manager ,DBS	Verticals of Banking
13.	Ashish Gupta	CEO & Global Business Head Evalserve	Finding success in corporate world
14.	Arundeeep Ahluvalia	Ex HoD, Department of Geology (P.U)	Global warming
15.	Deepa Kapoor	V.P CSR & Skill Development Punj Lloyd	Expectations of the corporate world
16.	Munish Sapra	Director, Indian School of Business	Tips for success in Interviews
17.	Pravesh Srivastava	Ex Group President, Anand Automotive Systems	The road to success
19.	Manohar Tegta	G.M- HR & Adm at Godrej Consumer Products Ltd.	Challenges of FMCG
20.	S. Sridhar	Ex-M.D, Citi Bank	Consulting as a career
21.	Vineet Anurag	M.D Bank of America Merrill Lynch	How to prepare a Financial Plan of your business
22.	Pratik Ved	Brand Manager - Lakme Skin at Hindustan UNilever Limited	Branding strategies
23.	Kamlesh Vyas	Director FISB Delhi , ex CEO ACME Associate Director at EY Gurgaon India	Recruitment & Selection
24.	Mukul Nanda	Founder/Director at Autologue Design Pvt Ltd	Chasing your dreams
25.	Arjun Singh	Ex MD , Hewitt	Perspectives of Human Resource in India
26.	Vivek Atray	IAS officer and also a Novelist/Author	Bouncing back in Life

S.No.	Expert	Designation	Topic
27.	Ajay Chaturvedi	Major General, AVSM, VSM (Retired)	'Ecological Challenges in the Himalayan Region
28.	Lt Gen. B S Jaswal	PVSM, AVSM **, VSM retired	Proactive Leadership
29.	Prof. Kulvinder Singh	Department of Education, Punjabi University Patiala	Research Analytical Tools/Sampling Error
30.	Prof. Subhash Davar	Dean Faculty of Commerce, Kurukshetra University	Research Methodology
31.	Prof. Narender Singh	Faculty of Commerce, Kurukshetra University	Research Methods
32.	Prof. S.S. Narta	Department of Management, Himachal Pradesh University, Shimla	Finance and Accounts
33.	Prof. Chaman Chandan	Department of Management, Himachal Pradesh University, Shimla	Principles that Make a Leader
34.	Mr Sumit Gupta	MD Meridian Pharmaceuticals	Scope in Sciences
35.	Nitin Sharma	MD, Orbit Biotech	Career Opportunities in Biotech
36.	Mr Rishi Gurukul	Aptitude Trainer, Chandigarh	Quantitative Analysis
37.	Mr Smrat Pujara	Associate Vice President, Baeclays Bank, Delhi	Marketing
38.	Dr. Arunesh Garg	Gyan Jyoti Insititute of Management, Mohali	SPSS

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

The School also uses case study methodology and other cutting edge pedagogy for teaching of its courses. These include:

- Power Point Presentations.
- Case Study Discussions.
- Group Discussions.
- Demonstration through Spreadsheets.
- Videos.
- Live Industry Projects.
- Problem solving.
- Role Plays.

- Business Games.
- Simulations.

The School has been making the extensive use of modern teaching methodologies and online lectures under eUniv initiative. The online lectures serve as supplement to classroom teaching where students get free access to the study material, power point presentations, audio-visuals, video lectures etc. It also serves as one point solutions for students to know their current standing in various internal assessments like assignments, quizzes, surprise tests and term examinations etc., most of which are on eUniv platform supported by a Learning Management System (LMS) called Moodle.

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

Each program and curriculum is outcome driven and the evaluation system ensures the monitoring of the outcomes through the regular assessment tools such as:

- Two mid term examinations in each semester.
- Surprise tests & quizzes.
- Case study discussions.
- Student seminar/presentations.
- Assignments.
- Projects.
- Group discussions.

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

Shoolini University strives to engage with people to bring about change in their lives and the society in general. Carrying this philosophy forward, School of Business Management & Liberal Arts has taken various initiatives as enumerated under:

- **Biz Quiz-** School has been conducting Biz Quiz in selected schools for developing in students the logical thinking, analytical assessment and decision making attributes.
- **Knowledge Sharing Program-** Faculty members visit selected schools to impart latest knowledge to the students and guide them on career opportunities.
- **Aid to Primary School:** Students and faculty as an initiative to enhance the lives of community around the campus have been

providing and distributing teaching aids and shoes to 'Government Primary School' at Village Manjholi.

- **Celebration of 'Children's Day':** Students and teachers of the School of Business Management & Liberal Arts celebrate the Children's Day with the students of Government School Children every year. Various games and activities are organized for the children and sweets are also distributed.
- **Participation in Swachh Bharat Abhiyan:** Students and faculty members have been actively participating in *Swachh Bharat Abhiyan*
- **Blood Donation Camp:** Students organized Blood Donation Camp in collaboration with civil hospital Solan and collected 50 units of blood. In addition, 'On Call' blood donation drive has also been initiated by the students from time and time in Civil Hospital, Solan.
- **Social Projects:** School has included social projects as a part of MBA curriculum since, 2014. Some of the social projects done by the students include project on rain water harvesting, save water, save environment and save energy etc.
- **Awareness Campaign on 'Girl's Education':** MBA students prepared a video on 'Girl's Education' as awareness campaign among the people of surrounding villages.
- **AIDS awareness & Anti-Ragging Campaign:** MBA Students have been conducting AIDS and Anti-Ragging Campaigns in the campus through poster making and videos.

In addition, faculty and students have been actively participating in extension activities organized at the University level which include 'Marathon' organized on Teachers Day, Tree Plantation, Moksh- Tech Fest, Flower fest.

48. Give details of "beyond syllabus scholarly activities" of the department.

School of Business Management & Liberal Arts encourages the students to develop key employability attributes beyond syllabus scholarly activities to further enhance their skills and constantly seek ways of adding value to them.

Some select activities include:

- Organizing Biz Quiz in different schools of Solan and surrounding areas since, 2011.
- Guest Lectures- Frequent interactions with industry experts which paves the way for a smoother "Campus to Corporate" journey.
- Workshops on MS-excel and aptitude development.
- Workshops on 'Resume Building' for students..

- Industrial visits.
- Industrial/educational tours.
- Internships in foreign countries.
- 'LAMPS'- news letter cum magazine by the students.
- 'Invincible'- students' club.
- Anti ragging campaigns by the students.
- Organizing various events and celebrations like Holi, Teacher's Day, Cultural Programs, Placement Week, and Women's Day etc.
- Various clubs initiated viz. *Samarthaya* for entrepreneurship, Shutterbug for photography, hiking trekking and dramatics club etc.
- Faculty has been delivering special lectures in different institutions.

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

School of Business Management & Liberal Arts has been rated by the different agencies from time to time for its excellence in various fields:

- Ranked 19th among top private business Schools in India by Dainik Bhaskar.
- Adjudged as the 'Best Private Upcoming Business School' by ASSOCHAM India.
- Rated A+++ by Go-Education.
- Innovations in Placements award in 7th Innovative B-School Awards by DNA.
- Ranked 5th in Research and Writing by Go-Education.

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

Keeping in view the demand for highly skilled and innovative manpower in the corporate world, School is committed to make its students, especially from rural and semi rural backgrounds) employable. The initiatives taken in this direction include:

1. 'SPRINT' is inspired by Stanford's mini-MBA Program – designed significantly to upgrade soft skills & capabilities of students. Led by top corporate & industry leaders, SPRINT involves exhaustive subject matter sessions on key management topics including business processes, development of business plan, finance, marketing, HR, operations & case study based highly interactive approach. SPRINT is structured around four key modules and outcome enhances the confidence, attitude and effectiveness in the management arena.

Table MT27: SPRINT Modules

Foundation Setting: <ul style="list-style-type: none"> • Usage of MS-Excel & IT in Management • Presentation Skills • Interview and GD Skills • Writing Reports and Business Plans 	Primer Courses: <ul style="list-style-type: none"> • Introduction to Finance • Operation Management Overview • Marketing Management • Human Resource Management • Strategy
Advanced Concepts: <ul style="list-style-type: none"> • Finance- corporate finance, valuation, capital markets • Marketing- understanding customers, product pricing & distribution • HR- Organizational design, personnel management • Operation Management- inventory management, supply chain management 	Communication & Current Affairs: <ul style="list-style-type: none"> • Current Affairs Workshops • Written Communication Workshops • Business Communication Workshops • Group Discussions & Mock Interviews

2. School also offered the following courses to generate new knowledge and enhance students' skills to meet the challenges of dynamic corporate and academic world:

- Tally for B. Com (Hons.) students.
- Basics of Banking.
- Soft and Technical skill enhancement through SPRINT Program.
- Drafting and corporate filing for B.Com (Hons.) students.
- International Financial Reporting Standard (IFRS).
- Association of Mutual Funds in India (AMFI) and Insurance. Regulatory & Development Authority (IRDA) Certification.

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

<p>STRENGTHS:</p> <ol style="list-style-type: none"> 1. Highly experienced faculty- A perfect blend of academia and industry experience 2. ‘SPRINT’- A unique soft and technical skill enhancement program inspired by Stanford Mini-MBA program 3. Best placements in the region 4. Modern teaching pedagogy- case study based and continuous learning through LMS 5. Knowledge enrichment through industry tours and frequent industry expert lectures 	<p>WEAKNESSES:</p> <ol style="list-style-type: none"> 1. North India centric 2. Need for more focus on research 3. Need to enhance inter disciplinary linkages 4. Need to enhance understanding between academia and industry 5. Need for more consultancy projects
<p>OPPORTUNITIES:</p> <ol style="list-style-type: none"> 1. Build on existing Industry linkages and tie ups 2. Enhance Student and faculty exchange programs 3. Explore research on Himalayan sustainability 4. Strengthening mentoring support system- both for students and faculty 5. Get NBA accreditation 	<p>CHALLENGES:</p> <ol style="list-style-type: none"> 1. Make rural and semi-urban students employable 2. Increasing competition- coming up universities and management institutes 3. Integrate School research with University’s research agenda 4. Attract students from other parts of the country and abroad 5. Further enhance faculty

52. Future plans of the department

The School has ambitious plans and aspires to be North India’s leading Management School. Based on our regular SWOC’s, specifically the School has identified five thrust areas for the future:

1. Collaborative research with major thrust on Himalayan issues.
2. Focus on consultancy services/projects.
3. Extensive faculty and students development programs.
4. Thrust on more industrial tie-ups and exchange programs.
5. Initiate international linkages.

8. Evaluative Report of School of Electrical and Computer Science Engineering

The School of Electrical and Computer Science Engineering under the Faculty of Engineering and Technology offers state of the art programs catering to technical education and hands on experience to its students. The School, in collaboration with IIT Bombay, DAMCO Solutions, Cyberoam and Reliance JIO, is focused on bridging industry- academia gap and strives to cater to current and the future requirements of the industry. The strength of the School lies in its well qualified faculty, technical expertise and research initiatives, reflected in effective course design and student focused pedagogy. The School adopts a multidisciplinary approach blending value driven education with global exposure through international exchange programs with top universities. The School has an active involvement in research endeavors not only in the field of computers, electrical and electronics but also in niche fields like bioinformatics thus contributing to the technological development of the Himalayan region and the nation. The School promotes quest for excellence by providing technological solutions to drive and support the vision of the university.

- 1. Name of the Department** : School of Electrical and Computer Science Engineering
- 2. Year of establishment** : 2009
- 3. Is the Department part of a School/Faculty of the university?**
Yes, it is part of the Faculty of Engineering & Technology.
- 4. Names of programs offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.)**
 - B.Tech. (Computer Science Engineering)
 - B.Tech. (Electronics and Communication Engineering)
 - B.Tech. (Electrical Engineering)
 - B.Tech. (Bioinformatics)
 - B.Tech. – MBA dual degree program
 - B.Tech. – M.Tech. dual degree program
 - M.Tech. (Computer Science Engineering)
 - M.Tech. (Electronics and Communication Engineering)
 - Ph.D. (Computer Science Engineering)
 - Ph.D. (Electronics and Communication Engineering)

5. Interdisciplinary programs and departments involved

a) School of Electrical and Computer Science Engineering programs supported by other Schools

School of Electrical and Computer Science Engineering is an interdisciplinary domain, which involves support from various Schools.

Following is the list of other Schools involved in the teaching of selective courses taught under different programs of the School:

Table EC01: List of Electrical and Computer Science Engineering programs supported by other Schools

S. No.	Programs	Schools
1.	B.Tech (Computer Science Engineering) B.Tech (Electronics and Communication Engineering) B.Tech (Electrical Engineering) B.Tech (Bioinformatics)	Biotechnology, Bioengineering & Food Technology, Mechanical and Civil Engineering, Chemistry, Physics and Materials Science
2.	B.Tech – MBA Dual degree	Business Management and Liberal Arts, Mechanical and Civil Engineering, Chemistry, Physics and Materials Science.
3.	M.Tech. (Computer Science Engineering) M.Tech. (Electronics & Communication Engineering)	Mechanical and Civil Engineering,
4.	Ph.D. (Computer Science Engineering) Ph.D. (Electronics & Communication Engineering)	Mechanical and Civil Engineering

b) Interdisciplinary Joint Programs

School of Electrical and Computer Science Engineering runs interdisciplinary joint programs along with other Schools. These are listed below:

Table EC02: Joint programs run by School of Electrical and Computer Science Engineering with other Schools

S. No	Programs	School
1.	B.Tech (Bioinformatics)	Biotechnology

6. Courses in collaboration with other universities, industries, foreign institutions, etc.

As a part of International and National tie – ups with various organizations School of electrical and computer science engineering has in place an exchange program for students and faculty to prosecute studies and undertake research at respective organization.

Table EC03: Courses in collaboration with other University / Industry

Courses	University / Industry
Blended MOOC	IIT Bombay
Semester Exchange Program	Suwon University and Gachon University, Korea
Software Testing	DAMCO Solution Ltd, UK
Network Security and Cryptography	Cyberoam, Bengaluru

7. Details of programs discontinued, if any, with reasons

B.Tech EEE is discontinued but B.Tech. (Electrical Engineering) started instead due to specific demand in Himachal Pradesh.

8. Examination System: Annual/Semester/Trimester/Choice Based Credit System

- Since its inception, School of Electrical and Computer Science Engineering follows semester and OCGPA grading system for B.Tech. and M.Tech. as per UGC guidelines.
- From the session 2015-16 the School has adopted Choice Based Credit System while meeting the UGC guidelines.

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

The School of Electrical and Computer Science Engineering offers a common courses like Computer Programming, Computer Fundamental, Basic Electronics and Basic Electrical to all the students of first year B.Tech. Engineering Degree. The courses offered to the other Schools are:

Table EC04: Participation of the School in the courses taught/offered by other Schools

Sr. No.	Courses Taught	Name of Program	Name of School
1.	Web Technology – II	B.Tech. (Mechanical Engineering)	Mechanical & Civil Engineering
2.	Web Technology – II	B.Tech. (Civil Engineering)	Mechanical & Civil Engineering

Sr. No.	Courses Taught	Name of Program	Name of School
3.	Computer Application	B.Sc. (Biotechnology)	Biotechnology
4.	Computer Application	M.Sc. (Biotechnology)	Biotechnology
5.	Computer Fundamentals	B.Sc. and M.Sc.	Basic Science
6.	Computer Applications	Ph.D.	All Faculties
7.	Industrial Automation	B.Tech (Mechanical Engineering)	Mechanical & Civil Engineering
8.	Industrial Automation	B.Tech. (Civil Engineering)	Mechanical & Civil Engineering
9.	Digital Electronics	B.Tech. (Biotechnology)	Biotechnology

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

Following are the posts sanctioned and filled in School of Electrical and Computer Science Engineering as per UGC norms:

Table EC05: Number of Post Sanctioned

Posts	Sanctioned	Filled
Professor	03	02
Associate Professors	06	06
Asst. Professors	20	17
Total	29	25

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

a) Faculty members from School of Electrical and Computer Science Engineering

School of Electrical and Computer Science Engineering excels in engineering and technology as an academic discipline with its highly qualified and experienced full time faculty who have several years of experience either as academicians or having worked at senior position in industry.

Table EC06: List of Faculty Members School of Electrical and Computer Science Engineering

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D. / M.Phil. students guided for the last 4 years
Dr Ram Prakash Dwivedi	Ph. D., Post Doc.	Professor	Integrated Photonics	11	Guiding 4 Ph.D. + 1 (M.Tech)
Brig Amar Cheema	M.Phil.	Professor cum Chief Knowledge Officer	Strategic Studies	40	-
Dr. Neeraj Gandotra	Ph.D.	Associate Professor	Reliability Properties;	9	-
Dr Hemant Sharma	Ph.D.	Associate Professor	Image Brain Mapping	4.0	-
Dr Sanjay Kumar Upadhyay	Ph.D.	Assistant Professor	Bioinformatics	2.0	-
Dr Varun Jaiswal	Ph.D.	Assistant Professor	Bioinformatics	1.0	Guiding 2 (M.Tech)
Er. Surender Sharma	M. Tech	Associate Professor	Software re-engineering	16	Guiding 2 (M.Tech)
Er. Pankaj Vaidya	M. Tech	Associate Professor	Programming	18	Guiding 2 (M.Tech)
Ms Poonam Nanda	M.A.	Associate Professor	Literature	12	-
Er. Raj Kumar Saini	M. Tech	Associate Professor	Power system, circuit theory, control system.	10	Guiding 2 (M.Tech)
Er. Gaurav Gupta	M.Tech	Assistant Professor	Mobile Adhoc Networks, Database, Machine Learning and Big Data	9	Guiding 3 (M.Tech)
Ms. Rajni Sharma	MCA	Assistant Professor	Operating System	7	-
Er. Sachin Sharma	M. Tech	Assistant Professor	Big Data using Hadoop, Network Security, Cryptography	9	Guiding 2 (M.Tech)
Er. Ashwani Sharma	M. Tech, Pursuing Ph.D.	Assistant Professor	Electronics & Communication Engineering	5	-

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D. / M.Phil. students guided for the last 4 years
Er. Rajesh Kumar	M. Tech	Assistant Professor	Electronics & Communication Engineering	5	-
Er. Vivek Kanwar	M. Tech	Assistant Professor	Wireless Communication; Networking	3.6	-
Er. Akshay Gupta	M. Tech	Assistant Professor	Microelectronics ; VLSI ; Embedded System ; Integrated Circuits and Systems Design	5	-
Er. Niharika Pal	M.Tech	Assistant Professor	MEMS, Wireless Nano-Sensor fabrications.	6	-
Ms. Shagun Gupta	M. Sc.	Assistant Professor	Systems Biology and Bioinformatics	3.6	-
Mr. Malay Srivastava*	M.Sc.	Assistant Professor	Bioinformatics	2.0	-
Mr Sunil Kumar	M.Tech	Assistant Professor	Vorticity of MHD flow of continuously moving vertical surface with uniform heat and mass transfer	10	-
Er. Meenakshi Nayyar	M.Tech	Assistant Professor	VANET; Software Engineering	7.5	-
Er Randhir Bhandari	M.Tech	Assistant Professor	Cryptography, Cyber Security and Authentication Protocols	5	Guiding 1 (M.Tech)
Mr. Vikrant Chauhan	M. P. Ed.	Assistant Professor	NIS	4	-
Ms. Bharti Thakur	MCA	Assistant Professor cum System Analyst	Software Engineering	5	-
Er. Ruchika Chandel	M.Tech. Computer Science	Assistant Professor	Computer Science	0.8	-
* Deputed from School of Bioengineering & Food Technology but not counted in teacher taught ratio.					

b) Faculty members from other Schools teaching at School of Electrical and Computer Science Engineering

School of Electrical and Computer Science Engineering runs interdisciplinary courses, which require faculty from other Schools. Following is the list of faculty members from other Schools taking these courses in School of Electrical and Computer Science Engineering

Table EC07: List of faculty member from other School

Name of faculty	Qualification	Designation	Specialization	Experience	School
Dr. Preeti Thakur	Ph.D.	Associate Professor	Material Science; Radar Technology	14	School of Physics & Materials Science
Dr. Radheshyam Rai	Ph.D.	Assistant Professor	Ferro electromagnetic Materials; Piezoelectric energy.	10	School of Physics & Materials Science

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

School of Electrical and Computer Science Engineering aim at developing technical experts by providing adequate interaction with leading subject matter experts and expose to the industry for the challenges of tomorrow.

Table EC08: List of Visiting Faculty and Adjunct Faculty for School of Electrical and Computer Science Engineering

S. No.	Category	Name	Organization
1.	Professor of Eminence	Er. C.P. Mahajan	Ex. Chief Engineer (OP) North HPSEB.
2.	Professor of Eminence	Dr. G.S. Virdi	Ex. Senior Scientist-cum-Administrator, CSIR-Central Electronics Engineering Research Institute (CEERI), Pilani
3.	Visiting Faculty	Dr. Hyoungh In Lee	Professor, Seoul National University, South Korea

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

14. Program-wise Student Teacher Ratio

B.Tech. : 14.9:1
M.Tech. : 6.7:1

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

Table EC09: List of Academic support and administrative staff

S. No.	Staff	Sanctioned	Actual
1.	Academic Support Staff (Technical)	12	12
2.	Administrative Staff	04	04

16. Research thrust areas as recognized by major funding agencies –

The research philosophy of the School is to develop global standards to emerge as an internationally acknowledged center for research and technical solutions. The School aspires to be a research driven institute which seeks to provide innovative technologies. Following five research areas have been identified:

- **Image Processing:** Image Processing and Multimedia, Digital Signal Processing – Internationally funded project by NextGen Innovation Inc., USA.
- **Software Engineering and Data Mining:** Data and Knowledge Mining, Software Engineering
- **Machine Learning:** Prediction Tool (Drug Design), Speech recognition using hidden mark of model and butter algorithm
- **Wireless Sensors Networks:** Networking and Mobile Computing, Wireless Communication & Networks, Antennas, An energy efficient routing protocol for wireless sensor networks
- **Integrated Photonics:** Plasmonics and Nano photonics, Transparent conducting oxide materials for flat panel displays.

17. Number of faculty with ongoing projects from a) national b) international funding agencies and c) Total grants received. Give the names of the funding agencies, project title and grants received project-wise. –**Table EC10: List of inter-institutional national collaborations**

S. No.	Name of PI	Project Name	Collaborator	Grant Received
1.	Mr. Pankaj Vaidya	Akaash Research and Development Center	IIT – Bombay under MHRD	2,50,000
2.	Dr. Varun Jaiswal	Innovation in Biometrics	NextGen Innovation Inc., USA	9,00,000

18. Inter-institutional collaborative projects and associated grants received

a) National collaboration

The School of Electrical and Computer Science Engineering values collaborative projects with other institutes or industry. The School has initiated collaborations in form of small projects with IIT Bombay and intends to encourage such tie-ups at a higher level. Following is the list of collaborative projects initiated with industry:

Table EC11: List of inter-institutional national collaborations

S. No.	Name of PI	Project Name	Collaborator	Grant Received
1.	Mr. Pankaj Vaidya	Akaash Research and Development Center	IIT – Bombay under MHRD	2,50,000
2.	Mr. Surender Sharma	Software Testing	DAMCO Solutions Ltd of United Kingdom	University Funding

b) International collaboration

Table EC12: List of inter-institutional International collaborations

S. No.	Name of PI	Project Name	Collaborator	Grant Received
1.	Dr. Varun Jaiswal	Innovation in Biometrics	NextGen Innovation Inc, USA	9,00,000

19. Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, AICTE, etc.; total grants received – 01

Refer to point number 17 (Table EC10) above

20. Research facility / Centre with

- State recognition : Nil
- National recognition
 - DRDC – Research Cell, DRDO (through Engineering Watch)
 - Akaash Research and Development Center by IIT – Bombay under MHRD
- International recognition : Nil

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

- Cyber Security Research Lab Sponsored by Cyberoam a SOPHOS Company – Computer Lab 1

- Communication Research Lab Sponsored by Reliance JIO – Computer Lab 2
- Open Source Research Lab Sponsored by Akaash R&D IIT Bombay – Information Technology Lab

22. Publications:

Total Publication

- Number of papers published in peer reviewed journals (national / international): 33
- Number in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.): In Scopus: 05
- h- index: 0.12
- Citation Index –Range /Average
 - Range: 0-12
 - Average = 0.833
- Impact Factor Range: 0 – 3.73
- SNIP: -
- SJR: -

List of publications:

Following is the publication list for School of Electrical and Computer Science Engineering:

1. Sharma B, Anand S (2015) “A survey-wireless sensor networks routing protocols”, *IJARECE*
2. Chawla A, Stobdan T, Srivastava RB, Jaiswal V, Chauhan RS, Kant A (2015) Sex-Biased Temporal Gene Expression in Male and Female Floral Buds of Seabuckthorn (*Hippophae rhamnoides*). *PloS one* Vol. 10 (4).
3. Anand S, Sujata (2015) Comparison of routing protocols in wireless sensor networks *IJES* Vol.3
4. Nayyer A, Thakur D (2014) "Multichannel Communication – A Need for Wireless Sensor Networks", *International Journal of Advanced Research in Computer Science and Software Engineering*, Vol. 4, Page No. 786-794
5. Bhandari R, Sharma S, and Sharma N, Bhandari R, Sharma S, and Sharma N Bhandari R, Choudhary A (2014) 3GPP AKA Protocol: Simplified Authentication Process *International Journal of Advanced Research in Computer Science and Software Engineering*, Vol 4(12), Page No. 655-658
6. Gupta Gaurav, Thakur Parul (2014) Image Compression Using Lossless Compression Techniques *International Journal of Recent and Innovation Trends in Computing and Communication* Vol. 2

7. Singh A, Dutta K and Gupta H, Chandle A, Kumar N and Bala A, (2014) Survey on load balancing algorithms for cloud computing, Passive Optical Networks Beneficial To Cloud Computing, Resource allocation in cloud computing environment using AHP technique *International journal of cloud Applications, International Journal of Computer Applications, International journal of cloud Applications and Computing* 6th, 93(11), 4(1) ,Page No. 66-72, 12-16, 33-44
8. Vaidya P, Sharam S, Dixia, Vaidya P, Sharam S, Sahil, Vaidya P, Makeakek A, Sharma S, Vaidya P, Vanndna ,Sakshi (2014) Analytics in Education Using Big Data, Review of Security and Privacy Issues in Cloud Storage System, SECURITY THROUGH SSL IN CLOUD COMPUTING, A Comparative Analysis of Private Key Cryptography Algorithms: DES, AES and Triple DES *International Journal of Advanced Research in Computer Science and Software Engineering* 2277128
9. Harun M Patel, Malleshappa N Noolvi, Poonam Sharma, Varun Jaiswal, Sumit Bansal, Sandeep Lohan, Suthar Sharad Kumar, Vikrant Abbot, Saurabh Dhiman, Varun Bhardwaj (2014) Quantitative structure–activity relationship (QSAR) studies as strategic approach in drug discovery *Medicinal Chemistry Research* Vol. 23, Page No.4991-5007
10. Sood A, Jaiswal V, Chanumolu SK, Malhotra N, Pal T, Chauhan RS (2014) Mining whole genomes and transcriptomes of *Jatropha* (*Jatropha curcas*) and Castor bean (*Ricinus communis*) for NBS-LRR genes and defense response associated transcription factors *Molecular biology reports*, Vol. 41, Page No. 7683-7695
11. Jaiswal V, Chauhan RS, Rout C (2014) Common Antigens Prediction in Bacterial Bioweapons: *A Perspective for Vaccine Design Infection, Genetics and Evolution*, Vol. 21, Page No. 315-9
12. Suthar SK, Jaiswal V, Lohan S, Bansal S, Chaudhary A, Tiwari A, Alex Novel (2014) quinolone substituted thiazolidin-4-ones as anti-inflammatory, anticancer agents: Design, synthesis and biological screening *European journal of medicinal chemistry*, Vol. 63, Page No.589-602
13. Chandel R, Gupta G (2013): “Attacks on Wireless Sensor Networks: A Survey”. *International Journal of Advanced Research in Computer Science and Software Engineering (IJARCSSE)* Volume 3, Issue 4, September 2013
14. Mattu M, Gupta G (2013): “Image Filtering Algorithms and Techniques: A review”. *International Journal of Advanced Research in Computer Science and Software Engineering (IJARCSSE)* Volume 3, Issue 4, September 2013
15. Kanwar V (2013). Performance evaluation of Block type and Comb type channel estimation for OFDM system. e-ISSN: 2250-3021, p-ISSN: 2278-8719 Vol.3, Issue 4

16. Kanwar V, (2013) Performance Evaluation of OFDM system under various modulation and channels. ISSN: 2320-8791, Vol. 1, Issue 3
17. Jaiswal V, Chanumolu SK, Gupta A, Chauhan RS, Rout C (2013) Jenner predict server: prediction of protein vaccine candidates (PVCs) in bacteria based on host-pathogen interactions *BMC bioinformatics*, Vol. 14 (1), Page No.211
18. NK Tailor, V Jaiswal, SS Lan, HB Lee, M Sharma (2013) Synthesis, Selective Cancer Cytotoxicity and Mechanistic Studies of Novel Analogs of Lantadenes Anti-Cancer Agents in *Medicinal Chemistry*, Vol. 13, Page No.957-966
19. Anand S, Kumar A (2012) "Zigbee for energy efficient reliable communication in the resource constrained military" *ICACCT*,1, 256-262
20. Mohindru V, Mehta A, Vaidya P, (2012) "Single Source Shortest Path Problem with Dijkstra and A*(A Review)", *International Journal of Computer Application*.
21. Sirkeck G, Gupta G, (2012) "Managing E-Waste in India: [A Review]". *International Journal of Scientific and Engineering Research (IJSER)* - (ISSN 2229-5518). IJSER 3, [Paper ID: I016347]
22. Gupta G, Goel Gupta D, (2012) "Security in Location Based Services: A Survey" *International Journal of Advance Research in Computer Science (IJARCS)* – (ISSN No. 0976-5697) Volume 3, No. 3
23. Gupta G, Goel Gupta D (2012) "Security in Location Based Services" *International Journal of Scientific and Engineering Research (IJSER)* - (ISSN 2229-5518). IJSER]
24. Gupta G, Goel Gupta D (2012) "Mobile Adhoc Networking Protocols' Evaluation through Simulation for QoS". *International Conference on Knowledge Management & Resource Sharing (ICKMARS)* – 2012, Muscat.
25. Bala A, (2012) "An Improved Watershed Image Segmentation Technique Using MATLAB". *International Journal of Scientific and Engineering Research*, Vol.3.
26. Pathania S, (2012) Predicting Energy Requirement for Cooling the Building Using Artificial Neural Network. *Journal of Technology Innovations in Renewable Energy*, Vol.1, Page No. 113-12
27. Bhardwaj S (2012) Mimo-Ofdm Comparison With Respect To Channel. Assessment *Journal of Electronics, Communication & Instrumentation Engineering Research*, Vol.2, ,Page No. 19-26
28. Aggarwal H, Pal N (2012), "Evolutionary on Multi-Hops Heterogeneous Wireless Networks", *International Journal of Research in Computer Science*" ISSN: 2249-8257" White Globe Publications
29. Harisharan Aggarwal, Mayank Gupta , Niharika Pal (2012), "Weibull Distribution using Radar" National conference on emerging trends in

computer science & Engineering , conference proceedings Page no. 215-222

30. Gupta G (2011) “Mobile Adhoc Networking Protocols’ Evaluation through Simulation for Quality of Service”. *International Conference on Computer and Computational Intelligence (ICCCI) Bangkok*, Published in ASME Press [Paper ID : C020]
31. Gupta G and Thakur P (2011) “Library Portal: A Gateway of Information”. *National Conference on Agricultural Librarians and User Community (NCALUC) – 2011*, Nauni, Published in book (ISBN 978-93-81075-59-3)
32. Gupta G (2011) “Web 3.0: The Semantic Web the future of Internet.” *National Conference on Agricultural Librarians and User Community (NCALUC) – 2011*, Nauni, Published in book (ISBN 978-93-81075-59-3)
33. Nayyer A (2011) “A comparative study of time synchronization protocols in WSN”. *IJCA*, Vol. 36, Page No. 13-19

Monographs - Nil

Chapters in Books - Nil

Edited Books - Nil

Books with ISBN with details of publishers - 7

Table EC13: List of Books Published with ISBN

Sr. No.	Author	Title of Book	Year	Publisher	ISBN
1.	Gaurav Gupta & Deepika Gupta	Software Engineering	2011	Eagle Prakashan, Jalandhar	978-3-8433-1013-0
2.	Gaurav Gupta & Deepika Gupta	Personal Computer Organization	2012	Eagle Prakashan, Jalandhar	978-93-82369-24-0
3.	Gaurav Gupta & Deepika Gupta	Computer Peripheral & Interfacing	2013	Eagle Prakashan, Jalandhar	978-93-82369-23-3
4.	Brig Amar Cheema	The Crimson Chinar – The Kashmir Conflict: A Politico – Military Perspective	2014	Lancer Publication, New Delhi	978-81-70623-01-4

Sr. No.	Author	Title of Book	Year	Publisher	ISBN
6.	Gaurav Gupta & Deepika Gupta	Operating System	2014	Eagle Prakashan, Jalandhar	978-93-83412-24-2
7.	Gaurav Gupta & Deepika Gupta	Data Communication & Networks	2014	Eagle Prakashan, Jalandhar	978-93-83412-23-5
8.	Gaurav Gupta & Deepika Gupta	Computer Architecture Revised	2014	Eagle Prakashan, Jalandhar	978-93-82369-28-8
9.	Gaurav Gupta, Amit & Deepika Gupta	Computer Graphics Revised	2015	Eagle Prakashan, Jalandhar	978-93-83412-32-7

23. Details of patents and income generated – 02

School has initiated for the following patents:

Table EC14: List of Patents

S. No	Inventors	Title of the Invention	Patent Filing No.
1.	Dr. Varun Jaiswal & Dr. Amit Seth	Construction of Bacillus sp. SC-2014 mutant with higher xylanase activity and better thermo stability than its corresponding parental strain	Submitted
2.	Mr. Sachin Sharma Mr. Gaurav Gupta Mr. Pankaj Vaidya Mr. Devender Thakur	Library Automation using Artificial Intelligence	Submitted

24. Areas of consultancy and income generated –

School is providing consultancy in following areas:

Table EC15: Consultancy Projects

S. No.	Name of Faculty	Title/Area	Organisation	Funding Agency
1.	Mr. Sachin Sharma	Wireless LAN upgradation and network maintenance	Govt. Senior Secondary School, Subathu, Distt. Solan	University Funding

Faculty members from the School of Electrical and Computer Science Engineering also provide consultancy in their areas of expertise as given below:

Table EC16: Consultancy by Faculty Members

S. No.	Faculty	Consultancy Topic	Institute/organization
1.	Mr. Sachin Sharma	Network Security	Govt. Polytechnic Sundernagar, April 2012
2.	Mr. Sachin Sharma	Network Security and Cryptography	Rayat Bahara University, Solan March 2013

25. Faculty selected nationally / internationally to visit other laboratories / institutions / industries in India and abroad.

As a part of international tie – up with foreign University School of Electrical and Computer Science Engineering has an exchange program in place for faculty to undertake research at the following laboratories.

Table EC17: List of Faculty visited other Laboratories / Institution / Industries

Sr. No	Faculty Name	Laboratories / Institution / Industries Visit
1.	Dr. R.P Dwivedi	Suwon University, South Korea
2.	Dr. R.P Dwivedi	Gachon University, South Korea
3.	Dr. R.P Dwivedi	Seoul National University, South Korea
4.	Dr. R.P Dwivedi	GIST University, Korea
5.	Mr. Pankaj Vaidya	IIT Bombay C Programming Lab
6.	Ms. Meenakshi Nayyer	IIT Bombay Computer Networks Lab

Sr. No	Faculty Name	Laboratories / Institution / Industries Visit
7.	Mr. Amit Nayyer	IIT Bombay DBMS Lab
8.	Mr. Sunil Pathania	IIT Bombay Cyber Security Lab
9.	Ms. Niharika Pal	IIT Kharagpur Analog Signals Lab
10.	Mr. Amit Nayyer	IIT Kharagpur ADA Lab
11.	Mr. Gaurav Gupta	NIT Hamirpur, Computer Networks Lab

26. Faculty Serving in

- National committees
- International committees
- Editorial Boards
- Any other

Table EC18: List of faculty members serving as experts in committees, resource persons, journal reviewers

Sr. No.	Name of faculty Member	Role
1.	Dr. R.P Dwivedi	Member of Review committee in RECEM (Recent Advances & Challenges in Engineering & Management)
2.	Dr. Varun Jaiswal	Member of Review Committee in Journal of Computers in Biology and Medicine. Member of Review Committee in Journal of Information Processing Systems.
3.	Mr. Gaurav Gupta	Member of International Association of Engineers (IAENG), since 2013.
4.	Brig Amar Cheema	Consultant Editor Indian Defense Review

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

Faculty Development Programs/ Refresher courses/ Workshops/ conferences/ orientation programs/ training programs:

- Mr. Surender Sharma, Mr. Gaurav Gupta, Mr. Neeraj Gandotra, Mr. Amit Nayyer, Mr. Narender Chandla and Ms. Vandana Mohindru attended Faculty Development Program organized by *British Library English Course* to be held in the University campus from 9th January 2012.
- Amit Nayyer, Gaurav Gupta, Pankaj Vaidya, Meenakshi Nayyer, Anju Bala, Avtar Singh, Sahil Hudda, Vandana Mohindru, Parul Verma, Madan Singh, Yazdan Khan, Surender

Sharma, Ajit Nath, Lalita Sharma, Sachin Sharma, Neeraj Gandotra, Akshay Gupta, Jagmohan Singh, Niharika Pal, Sunil Pathania, Shivam Sharma, Neeraj Mishra, Rajesh Kumar, Challa ram Gopal, Raj kumar Saini, S.R Prabhakar, Ashwani Sharma, Gurmeet Singh, Jyoti Bhola attended 2-Days ISTE workshop on *Aakash for Education* at Shoolini University on 10th and 11th Nov 2012.

- Pankaj Vaidya, Amit Nayyer, Gaurav Gupta, Surender Sharma, Madan Singh, Avtar Singh, Ajit Nath, Anju Bala, Vandana Mohindru attended Workshop on *Database Management System* 21 May to 31 May 2013 in the campus of Shoolini University in collaboration with IIT Bombay.
- Gaurav Gupta, Anju Bala, Meenakshi Nayyer, Sachin Sharma, Surender Sharma, Randhir Bhandari, Akshay Gupta, Rajesh Kumar, Sanjay Bhardwaj, Sunil Kumar, Niharika Pal Arora, Dr. R. P. Dwivedi, R. K. Saini, Ashwani Sharma, Sakshi Anand Workshop on *Computer Programming* 16 June to 21 June 2014 in the campus of Shoolini University in collaboration with IIT Bombay.
- Pankaj Vaidya, Gaurav Gupta, Surender Sharma, Sachin Sharma, Randhir Bhandari, Ram Parkash Dwivedi, Sakshi Anand, Sunil Pathania, Rajesh Kumar Workshop on *Computer Networking* 30 June to 5 July 2014 in the campus of Shoolini University in collaboration with IIT Bombay.
- Raj Kumar Saini, Ashwani Sharma, Rajesh Akela, Bharti Thakur, Leela Dhar, Preeti Sharma Workshop on *Cyber Security* 10 July to 20 July 2014 in the campus of Shoolini University in collaboration with IIT Bombay.
- Gaurav Gupta, Surender Sharma, Meenakshi Nayyer, Ruchika Chandel, Namita Gandotra, Pankaj Vaidya, Neeraj Gandotra, Sunil Kumar Workshop on *Algorithm Analysis and Design* 25 May to 30 May 2015 in the campus of Shoolini University in collaboration with IIT Kharagpur.

Following faculty recharge programs were conducted by the department:

Tale EC19: List of faculty recharge programs.

S. No.	Topic	Year	Resource Person
1	Thesis & Paper Writing	2015	Dr. Klaus von Gadow, University of Germany
2	Personality Development	2015	Prof. B. L. Dubey, University of Alaska, and Director SIS, Anchorage, USA
3	Training on Digitization of Library – II	2015	Mr. Sachin Sharma Mr. Gaurav Gupta Mr.Devender Thakur, Shoolini University

S. No.	Topic	Year	Resource Person
4	eUniv-LMS	2014	Ms Flourence Martin, Associate Professor, University of North Carolina, USA
5	Spiritual Leadership- I & II	2014	Mr Rajendra Abhange, Senior Director Technology, Gabriel India
6	Curriculum Development	2014	Ms Pooja Gupta, Consultant Higher Education
7	Training on Digitization of Library – I	2015	Mr. Sachin Sharma Mr. Gaurav Gupta Mr.Devender Thakur, Shoolini University
8	Faculty Development Program	2014	Dr. Manish Pandey, Cambridge Certified Faculty Developer and Trainer
9	Faculty Development Program	2014	Mr. Sachin Sharma Mr. Gaurav Gupta Mr. Pankaj Vaidya, Shoolini University
10	Research Writing	2013	Ms Andrea Wright, Brown University, USA
11	eUniv	2013	Mr. Kamal Kant, Shoolini University

28. Student projects

- percentage of students who have done in-house projects including interdepartmental projects – 84%
- percentage of students doing projects in collaboration with other universities / industry / institute – 16%

Table EC20: List of Student initiated projects

Batch	B.Tech CSE / ECE / EE
2009 - 2013	8 [two groups of 4 students each]
2010 - 2014	32 [Eight groups of 4 students each]
2011 - 2015	32 [Eight groups of 4 students each]
2012 - 2016	40 [Ten groups of 4 students each]
2013 - 2017	28 [Seven groups of 4 students each]
Batch	B.Tech ECE / EE
2010 - 2014	30 [Six groups of 5 students each]
2011 - 2015	60 [Fifteen groups of 4 students each]
2012 - 2016	37 [Eight groups of 4 students each + One group of 5 students]
2013 - 2017	31 [Seven groups of 4 students each + One group of 3 students]
Batch	B.Tech EE
2012 - 2016	17 [Three groups of 4 students each + One group of 5 students]
2013 - 2017	18 [Six groups of 3 students each]

Batch	M. Tech. CSE / ECE
2012 - 2014	13 individual projects
2013 - 2015	13 individual projects
2014 - 2016	22 individual projects

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

- **Faculty** : 1
 - Dr. R.P. Dwivedi IEEE Photonic Society Award 2010 at IIT Guwahati
- **Doctoral / post-doctoral fellows** : 02
 - Ms. Vandana – Ph.D. fellowship from Jaypee University, Wahnaghat, Solan
 - Dr. Sanjay – Postdoc from China
- **Students** : Nil

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

Table EC21: List of Workshop Organized

Sr. No.	Workshop Name	Funding Agency	Date
1	Database Management System	IIT – Bombay	21-5-13 to 31-5-13
2	Analog Electronics	IIT – Kharagpur	3-6-13 to 13-6-13
3	Computer Programming	IIT – Bombay	2-6-14 to 13-6-14
4	Computer Networking	IIT – Bombay	16-6-14 to 21-6-14
5	Cyber Security	IIT – Bombay	10-7-14 to 20-7-14
6	Introduction to Design of Algorithms	IIT – Kharagpur	25-05-2015 to 30-05-2015

31. Code of ethics for research followed by the departments

Yes, School follow the IEEE code of Ethics

32. Student Profile Program wise –

Table EC22: List of Student Profile Program wise

Name of the Programme (refer to question no. 4)	Application Received	Selected		Pass Percentage	
		Male	Female	Male	Female
B.Tech CSE [2009]	12	6	4	83%	100%
B.Tech CSE [2010]	35	14	13	93 %	85 %
B.Tech CSE [2011]	37	15	09	--	--
B.Tech CSE [2012]	35	16	18	--	--
B.Tech CSE [2013]	26	8	10	--	--
B.Tech CSE [2014]	32	07	11	--	--
B.Tech ECE [2010]	110	63	30	85 %	97 %
B.Tech ECE [2011]	65	27	14	--	--
B.Tech ECE [2012]	40	13	10	--	--
B.Tech ECE [2013]	30	10	12	--	--
B.Tech ECE [2014]	20	7	7	--	--
B.Tech EE [2012]	20	10	2	--	--
B.Tech EE [2013]	16	12	3	--	--
B.Tech EE [2014]	15	11	2	--	--
B.Tech BI [2011]	2	2	0	--	--
B.Tech BI [2012]	8		2	--	--
B.Tech BI [2013]	15	3	3	--	--
B.Tech BI [2014]	6	2	1	--	--
B. Tech-MBA[2010]	NA	0	1	-	100
B. Tech-MBA[2013]	NA	0	1	-	-
B.Tech CSE-L [2012]	10	4	4		
B.Tech CSE-L [2013]	10	3	4		
B.Tech CSE-L [2014]	15	5	6		
B.Tech ECE-L [2012]	20	12	5		
B.Tech ECE-L [2013]	16	8	4		
B.Tech ECE-L [2014]	12	5	3		
B.Tech BI-L[2014]	2	1	0		
M.Tech CSE [2012]	10	3	6	100 %	100 %
M.Tech CSE [2013]	11	3	5	--	--
M.Tech CSE [2014]	12	0	5	--	--
M.Tech ECE [2013]	8	3	2	--	--
M.Tech ECE [2014]	16	2	6	--	--
M.Tech CSE-I [2014]	6	2	2		
M.Tech ECE-I [2014]	6	5	0		
Ph.D ECE [2013]	5	1	2	--	--
Ph.D ECE [2014]	2	1	0	--	--

33. Diversity of Students

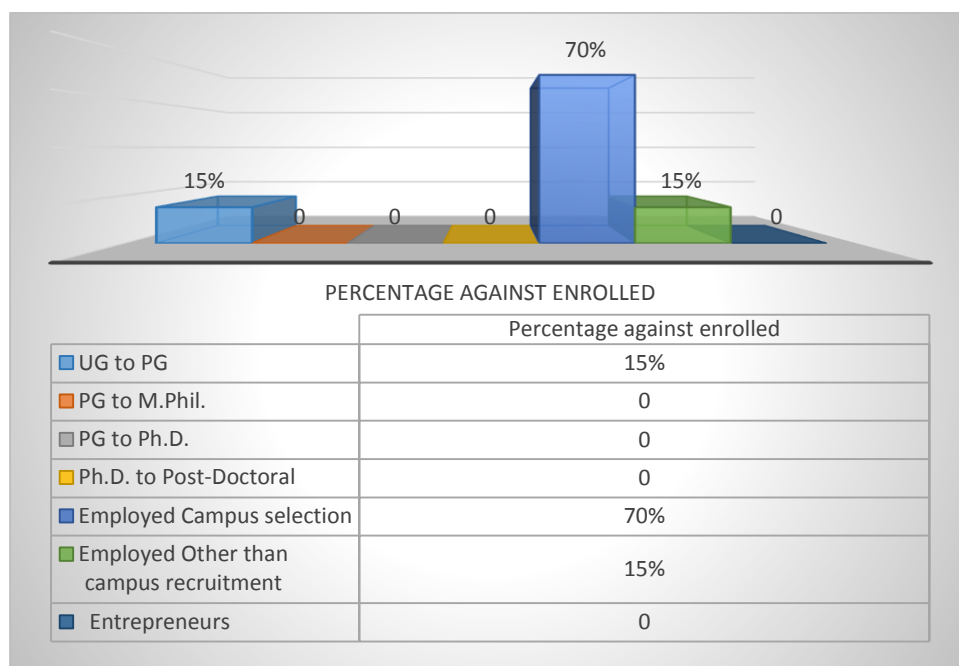
Table EC23: Diversity of Students

Name of the Program (refer to question no. 4)	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
B.Tech CSE [2009]	None	75%	25%	None
B.Tech CSE [2010]	None	76%	24%	None
B.Tech CSE [2011]	None	85%	15%	None
B.Tech CSE [2012]	None	80%	20%	None
B.Tech CSE [2013]	None	80%	20%	None
B.Tech CSE [2014]	None	77%	23%	1%
B.Tech ECE [2010]	None	88%	12%	None
B.Tech ECE [2011]	None	82%	18%	None
B.Tech ECE [2012]	None	81%	19%	None
B.Tech ECE [2013]	None	79%	21%	None
B.Tech ECE [2014]	26%	78%	22%	None
B.Tech EE [2012]	None	87%	13%	None
B.Tech EE [2013]	None	83%	17%	None
B.Tech EE [2014]	None	76%	24%	None
B.Tech BI [2011]	None	79%	21%	None
B.Tech BI [2012]	None	89%	11%	25%
B.Tech BI [2013]	None	88%	12%	None
B.Tech BI [2014]	None	78%	22%	None
M.Tech CSE [2012]	31%	59%	10%	None
M.Tech CSE [2013]	70%	20%	10%	None
M.Tech ECE [2014]	25%	50%	25%	None
Ph.D. ECE [2013]	25%	50%	25%	None
Ph.D. ECE [2014]	25%	50%	25%	None

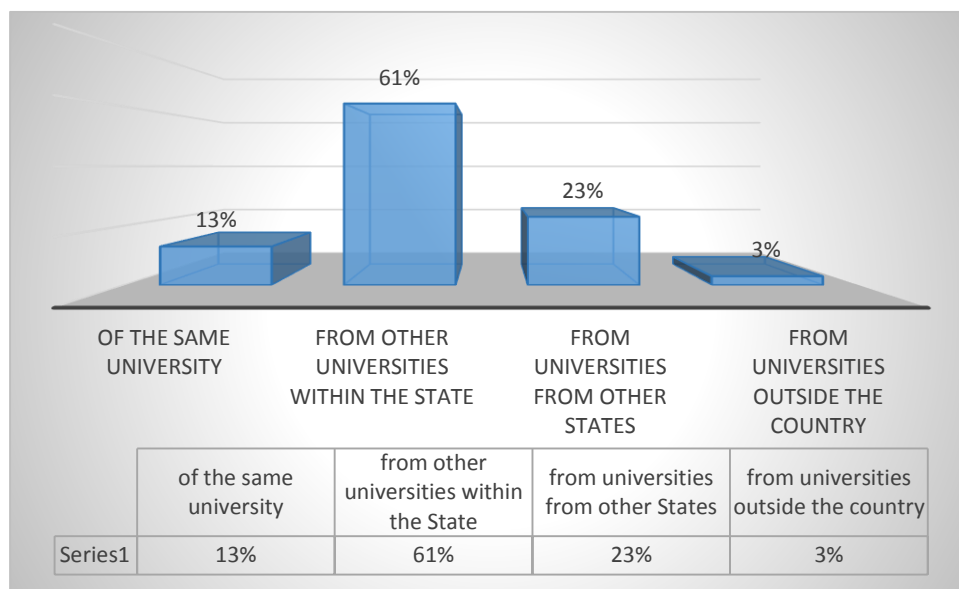
34. How many students have cleared Civil Services and Defense Services examinations, NET, SET, GATE and other competitive examinations? Give details category-wise. – Nil

Since barely two batches of B.Tech. Computer Science and Electronics have passed out of the School so far, more such successes are expected in the forthcoming batches.

35. Student progression



36. Diversity of staff



37. Number of faculty who were awarded M.Tech., M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period – 04

Table EC24: List of faculty members awarded Ph.D. degree during assessment period

Sr. No.	Name of the faculty	Ph.D. / M.Tech awarded year	University
1	Dr. Varun Jaiswal	Ph.D., 2014	Jaypee University

38. Present details of departmental infrastructural facilities with regard to

a) Library- Central Library

The School utilizes the fully digitized Central library of the University where faculty and students get both formal and ‘out-of-classroom’ learning through the Learning Management System (LMS) and Knowledge Management System (KMS). Moreover it also extends the reach of Shoolini University’s online platform (eUniv). Here magazines, journals and newspapers are provided to encourage the habit of reading among students.

Moreover, the School has its own library, which is linked to the Central Library. Here, we have kept minimum physical books and journals and, the School library is more in the form of a ‘virtual’ library. Following books and journals are available for students in the library:

- Total Book Volumes available: 11819
- Reference Books : 722
- Print Journals : 48 + 9000 (combined science, technology and management)

b) Internet facilities for staff and students

- **Staff** - Internet facility is provided to all Staff members.
- **Students** - Campus wide Wi-Fi connectivity

c) Total number of class rooms – 4 Rooms

d) Class rooms with ICT facility : All

e) Students’ laboratories : 14

Table EC25: List of student’s Laboratories

Lab Name	Description
Computer Lab 1	Network Security & Cryptography ; Networks ; Unix & Network Programming; Data Structures ; Mobile Computing ; Java Programming; Project Middleware Technologies ;RDBMS

Lab Name	Description
Computer Lab 2	Optical Fiber Communication; Bioinformatics (Biolinux) ; Web Services ; Graphics and Multimedia ; Object Oriented Programming using “C ++”
Information Technology Lab	Algorithm and Design Lab ; Information Technology Lab
Mat Lab	Matlab ; Scilab
Computer Center	C & C++ ; Autocad ; Proe
Analog and Power Electronics	In this lab students will learn about analog electronics like amplifier,
	In this lab SCR, DIAC, TRIAC experiments were performed to learn the
Television Engineering	Students will learn the complete working of monochrome and color
Microprocessor and Microcontroller	In this lab students will learn basic programing of Microprocessors as Microprocessors are being used in a wide range of communication equipment's like: in digital telephone sets, telephone exchanges, in television, satellite communication, etc.
	Interfacing with different peripherals like LCD, A/D Converter, Keypad, Stepper Motor etc. and students will also learn the programing of microcontroller
Digital Electronics	We know there are two types of signals, one is analog or continuous signal and the second one is Digital or discrete signal. Now coming to the area of Digital Electronics
Basic Electronics Engineering Lab	in basic electronics lab students will learn about the basic components used in electronics
Basic Electrical Engineering Lab	in basic electronics lab students will learn about the basic components used in electronics
Electrical Measurement and Instrumentation	in this lab students performs practical related to the instrumentation and measurements and at the end they were able to do measurements
Electronic Measurement and Instrumentation	in this lab students performs measurements and at the end they were able to do measurements
Microwave Engineering	In today's life Microwave frequencies are used in various fields and in this lab students will learn how to use microwave frequencies in fields like communications etc.

f) Research laboratories : 02

Table EC26: List of Research Laboratories

Lab Name	Description
Cyber Security Research Lab (In Collaboration with Cyberoam)	Network Security & Cryptography ; Networks ; Unix & Network Programming; Data Structures ; Mobile Computing ; Java Programming; Project Middleware Technologies ;RDBMS
Open Source Lab (In Collaboration with IIT Bombay)	Open source Software : Scilab, Linux, and many more

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

a) from the host institution/university– 04

Table EC27: List of doctoral students from Shoolini University

Sr. No.	Name of the Candidate	Research Supervisor
1	Mr. Pankaj Vaidya	Dr. Ram Prakash Dwevidi and Dr. Varun Jaiswal
2	Mr. Surinder Pal	Dr. Ram Prakash Dwevidi
3	Ms. Parul Sharma	Dr. Ram Prakash Dwevidi and Dr. Varun Jaiswal
4	Ms. Divya Sharma	Dr. Ram Prakash Dwevidi

b) from other institutions/universities – Nil

40. Number of post graduate students getting financial assistance from the university. – 05

Several UG and PG students receive financial assistant from university. Following is the list of PG/Ph.D. students who have received financial assistance from the university:

Table EC28: List of PG students getting financial assistance from university

Sr. No	Name of Student
1	Mr. Pankaj Vaidya
2	Ms. Divya Sharma
3	Ms. Parul
4	Mr. Sanjay Bhardwaj
5	Mr. Brij Bhushan

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

Yes, the need for new programs and courses is assessed from the time to time. Dean of the Faculty proposes new programs on basis of inputs from the external stake holders including the potential employers, alumni and academicians. Internal inputs are taken from faculty of the School and students. The proposal is put forward to Board of Studies (BOS) which evaluates and assesses the programs based upon the inputs taken around the parameters of employability and global scenario in the profession. Based upon the analysis of BOS, Academic Council considers the approval of new program.

42. Does the department obtain feedback from

a) Faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

Yes, feedback of the faculty is taken on curriculum development and teaching-learning evaluation. Academic Committee has been constituted as per the directions of Academic Council which includes all the faculty members and experts from industries. The committee under the chairmanship of Dean meets periodically to discuss the curriculum, teaching-learning-evaluation and research issues. Following initiatives have been taken in the School as per the recommendations of the committee:

- New programs Bioinformatics introduced.
- New courses like persona enhancement, Aptitude Development, etc. introduced
- Improved pedagogy- case study method and online study material through eUniv

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

Yes, student's feedback is taken at the closing of every semester. A well-structured format is used for collecting students' feedback regarding the faculty teaching & evaluation, curriculum etc. Students' feedback is taken as the basis for introducing a new course/program, development and redesigning of curriculum at departmental level and for development of the University at large. Courses like persona enhancement, written and verbal communications and aptitude development have been introduced as per students' feedback.

c) Alumni and employers on the programs offered and how does the department utilize the feedback?

Yes, the School takes Alumni and Employers' feedback on the programs and curriculum offered. Employers' feedback is taken during their visits to the campus for placements of the students, whereas the alumni feedback is taken during the 'Alumni Meet'. Alumni are frequently invited for an interaction with the students during 'SPRINT' program and for their feedback on the academic programs and courses which is incorporated in the revision of curriculum and courses.

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

The University is too young to have distinguished Alumni as it is only five years old. However, the alumni who are not distinguished but are on the path of success have been listed below:

Table EC29: List of successful alumni

Sr. No.	Student's Name	Course	Year	Company
1	Pramod	B.Tech ECE	2013	Gabriel
2	Monica	B.Tech CSE	2014	DAMCO Soft
3	Nitish	B.Tech CSE	2014	DAMCO Soft
4	Ramanuj Barai	B.Tech ECE	2014	IBM
5	Ashish	B.Tech ECE	2014	Bebo Technology
6	Neelesh Sharma	B.Tech CSE	2015	Vegazva
7	Annu Saroch	B.Tech CSE	2015	Trantor
8	Akshi Chauhan	B.Tech CSE	2015	Emicon
9	Arjun Singh	B.Tech CSE	2015	Manprax
10	Mehar Singh	B.Tech ECE	2015	Vegazva
11	Rohit Maini	B.Tech ECE	2015	TCS iON

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

The School organizes student enrichment programs regularly involving external experts to enrich the experience of students and acquaint them with the latest developments.

- FOSS (Free Open Source Software) courses from IIT Bombay Spoken Tutorial
- Aptitude Development
- Persona Enhancement
- Special certification courses on Linux, Latex, Scilab, Python, C/C++ and PHP MySQL from IIT Bombay under MHRD.
- Workshop on Animation in collaboration with Focus iTech Solution, October, 2014
- Workshop on ADA in collaboration with IIT – Bombay
- SPRINT Program
- Guru Series lectures

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

The School employs combination of traditional and modern teaching methodologies while encouraging the use of technology. In addition to chalk talk, active participation in eUniv, LMS is there. eUniv helps to provide online teaching material to students. The presentation and analytical skills of students are enhanced through seminar presentations by students. Practical curriculum is linked to the theory courses and equal weightage is given to both practical and theoretical training.

Different teaching methods adopted by the faculty for different programs are:

- **Lecture method:** Teaching through lectures by using chalk and talk as well as LCD projectors.
- **Interactive method:** Teaching through conducting debates on the topics related to the subject handling.
- **Project based learning:** Analyzing, designing, implementing and documenting skills of the students are improved by assigning mini-projects, full semester projects.
- **Computer assisted learning:** Quizzes / Assignments are conducted through LMS (Learning Management System)
- **Experimental learning:** The students are trained to do programming through lab experiments.
- **Seminars:** The students are encouraged to take Technical seminar which is used to improve the presentation skills of the students.

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

The objectives and learning outcomes are monitored from time to time through regular assessment tools like:

- Two mid-term and one end term examinations in each semester
- Surprise tests & quizzes
- Case study discussions
- Student seminar/presentations
- Assignments
- Projects
- Group discussions

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

Students and faculty members are actively involved in various extension activities. Following is an illustrative list of extension activities organized by the School:

- IT awareness and maintenance at Government Senior Secondary School, Subathu June 2014.
- IT awareness at Government Primary School, Manjoli June 2015
- Engineer's Day celebrated every year by organizing various events and lectures to increase awareness about the engineering profession.
- Participation in National Social causes through local activities such as Swachh Bharat Abhiyan and more.
- Project Exhibition and competition by first year B.Tech students in Techfest MOKSH 2015
- Participation in 'Marathon' on Teachers' Day.
- Tree Plantation in local landslide areas.

48. Give details of "beyond syllabus scholarly activities" of the department.

Beyond syllabus scholarly activities are regular feature in the School. The journal club, seminars, workshops, conferences, training programs, industrial visits & trainings, invited talks, etc. are regularly organized to keep the students well informed about the developments in the field of electrical and computer science engineering. The interactions of students with the experts from industry and academia exposes them to the best minds in the field. Faculty members from the School have also delivered guest lectures at different institutes. Details of different conferences, workshops and paper presentations are already provided in point no. 24, 27 and 30.

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

Department has been rated by the different agencies from time to time for its excellence in various fields:

- Adjudged as the Most Upcoming Engineering College in North India', 2014 by ASSOCHAM
- Akaash (R&D) Remote center for IIT Bombay.
- Nodal online examination center by TCS.

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

Details of collaborations, published research papers, patents filed and consultancies are provided in point no. 18, 22, 23 and 24.

- Provided the technological solution for the digitization of the Central Library, Language Lab and ERP for the university

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

Strengths:

Development and driving technological innovation

The School is the nodal agency and under the aegis of the Chief Information Officer is the driving force to provide technological solutions aimed at generating a paradigm shift in the learning pedagogy. Break through improvements like digitization of the Library, development of LMS package for the eUniv platform, KMS and the ERP have all been adapted, innovated and implemented across the university by the School for which a patent has been registered.

Strong student and faculty exchange program

The School has proactively initiated student and faculty exchange program and has successfully established collaboration with reputed global universities like Seoul National University ranked 23rd globally. Under these programs 10 students of the School have taken one semester course each in the last two academic sessions in Gachon & Suwon University as well as in GIST Korea. Four of these students have been granted fully funded scholarships worth Rs.18 Lacs per annum each for pursuing postgraduate and Ph.D. programs. A prominent visiting professor from Seoul National University conducted classes for a month while one student from Gachon University, South Korea attended classes for one semester at the School.

Industry aligned course curriculum.

Eminent experts from Industries and Top education institutes are part of our curriculum development team. The School has collaborations with DAMCO Solution Ltd of UK for Software Testing, Cyberoam for Network Security, Reliance JIO for Optical Fiber Communication and IIT Bombay for blended open source technologies.

Technological support and certified computer laboratories

The School offers certification courses in collaboration with IIT Bombay – Talk to Teacher Program under MHRD for students to enhance their technical skills such as Linux, Latex, Scilab, Python, C/C++ and PHP, etc. The School provides its facilities and services for conducting national level online tests such as GATE, Banking and LIC in collaboration with Tata Consultancy Services.

Strong focus on inclusive development of students and their placements.

The School has included programs like Persona Enhancement and aptitude building as a part of its curriculum. SPRINT, an accelerated learning program covering both soft and technical skills is conducted proactively for overall development of the student. Students as well as the faculty are actively involved in social and cultural activities to develop leadership traits, foster team work and develop communication skills. These measures have gone a long way in ensuring good internship and placements.

Weaknesses:

Limited research initiatives

While the School has been striving towards creating more research opportunities and opening more avenues the efforts have yet to fructify.

Need for strengthening industrial collaboration for research

Although the School has established collaboration with leading institutes and industries, there is a requirement to broad base and strengthen research collaboration, especially in the niche technologies.

Limited external funding

The School has limited number of projects that are externally funded despite the vast scope that exists.

Limited consultancy projects

Despite the technological potential and the market that exists, the School has not been able to leverage the opportunities adequately.

Opportunities:

Expansion and strengthening of international collaborations

While the School has collaborations with few foreign universities, further opportunities to expand and strengthen such collaboration can be explored.

Strengthening industry - academia collaboration

In order to leverage collaboration with industry, the School could strive for strengthening these further by setting up specialized facilities such as Software Testing, Network Security, Cloud Computing, Machine Learning, Robotics and many more.

Skill development

Government of India is promoting program under NSDC for enhancing skills in various fields. There is a scope to take more initiatives in this direction.

Interdisciplinary approach

While the School is offering multidisciplinary courses like Bioinformatics and dual degree programs with other Schools there is scope to further develop more such program under CBCS.

Challenges:

Keeping pace with emerging technologies

To cater to the growing needs and expectations of the industry, the School needs to align the technological areas with the emerging requirements of the industry.

To raise the quality of infrastructure to be at par with global standards

The School needs to further improve the quality of research and infrastructure to be compatible with international standards in order to enhance the global collaboration for student and faculty exchange programs.

Collaborative industrial research projects

In order to further improve the quality of research, collaborations with the industry have to be strengthened. The School aspires to partner with premier research agencies to promote such initiatives.

Raise research funding and generate patents

The School aims to bring in more nationally and internationally funded projects and patents. Although, some projects are under execution, efforts have to be made to obtain higher financial grants.

Increase the number of quality research publications

More efforts are required to encourage faculty and students to raise the number and quality of research publications.

52. Future plans of the department.

Despite a brief history of only a couple of batches having passed out, School of Electrical & Computer Science Engineering is striving to make rapid progress and to be counted amongst the top 50 Engineering Schools of the country in the next 5 years. It has identified the following key milestones to achieve that objective:

Effective pedagogy and course curriculum:

The School endeavors to raise effectiveness of its pedagogy to global standards by further improving the 3 contributing factors, viz. rationalized curriculum structure, excellence in teaching quality and proactive academic collaborations with credible national and international institutes of repute. Course curricula are being restructured to Choice Based Credit System (CBCS), measures are being taken to enhance teaching quality in every respect and collaborations with top institutes like IIT Bombay for Blended MOOCs program, faculty and student exchange programs with Seoul National University South Korea and others are being actively pursued.

Strengthening of industrial linkages to improve employability:

While significant grounds have been made in establishing industrial linkages with DAMCO Solutions of UK and others, such partnerships need to be strengthened and expanded. School already initiated skill development programs with IIT Bombay, the School plans to extend multiple such modules to enhance relevant skills of its students in order to make them more employable and industry-ready with NSDC.

Sharper research focus:

The School needs to raise its research initiatives and activities by greater involvement of its faculty. It plans to accomplish this by upgrading its research infrastructure and also by adding more Ph.Ds. and Post docs in the faculty. It plans to establish Centers of excellence in emerging technologies like Robotics, Informatics, and Cloud Computing. The School intends to keep pace with the emerging technology by pursuing research work in the contemporary challenging domains such as Image / Voice Processing Applications, Cloud and Grid Computing, Web Technology, Bioinformatics Applications besides other areas.

Research and consultancy funding:

Stronger, deeper and multiple industrial tie-ups coupled with upgraded research capabilities will be leveraged and lead to opportunities of entering into funded joint research as well consultancy projects.

To get accredited by NBA and qualify for Washington accord:

The School plans to apply for National Board of Accreditation (NBA) accreditation for the B.Tech program. Consequently, the School will be recognized by Washington Accord, which is an international agreement among bodies responsible for accrediting engineering degree programs. Thus, our B.Tech students will be benefited not only for pursuing higher degrees in other signatory countries but also meet the academic requirements for entry to the practice of engineering.

9. Evaluative Report of School of Mechanical & Civil Engineering

School of Mechanical & Civil engineering was established in 2010 with a vision to be a leading institute imparting quality education and facilitating research. The key objective was to play an active role in improving skills and employability of the youth in the region by offering academic excellence, equipping them to contribute effectively in the development of the region and nation. The School is actively engaged in research in the areas of solar energy, heat transfer, composite materials, structures, highways, infrastructure and environment etc. The faculty members have published research papers in peer reviewed journals.

Fostering competencies which are aligned to the global needs of the industry amongst students is a key endeavor at the School. Center of Excellence in Automobile Engineering has been set up in partnership with Anand Automotive limited, a leading automobile company having multiple joint ventures with major global players. Several measures have been initiated which are aimed at inculcating Value System amongst students. Technology is increasingly being used in the class rooms to make learning more effective. IT enabled Yogananda library and on-line lectures under eUniv initiatives are further steps in this direction. There is an underlying quest for excellence in every academic process and its delivery in the School of Mechanical and Civil Engineering – in line with the vision of Shoolini University.

- 1. Name of the Department :** School of Mechanical & Civil Engineering
- 2. Year of establishment :** 2010
- 3. Is the Department part of a School/Faculty of the University?**
Yes, School is the part of Faculty of Engineering and Technology.
- 4. Names of programs offered (UG, PG, Ph.D., Integrated Masters Etc.)**

School of Mechanical and Civil Engineering offer following programs:

- B.Tech. Mechanical Engineering
- B.Tech. Mechanical Engineering (Specialization in Automobile Engineering)
- B.Tech. Civil Engineering
- B.Tech. – M.Tech dual degree program
- B.Tech. Nanotechnology
- M.Tech. Mechanical Engineering
- M.Tech. Civil Engineering
- Ph.D. Mechanical Engineering
- Ph.D. Civil Engineering

5. Interdisciplinary programs and departments involved:

a) School of Mechanical and Civil Engineering supported by other Schools

Mechanical and Civil Engineering is an interdisciplinary field, which involves support from various Schools across the faculties. Following is the list of other Schools involved in the teaching of selective courses taught under different programs of Mechanical and Civil Engineering

Table MC01: List of Mechanical and Civil Engineering programs supported by other Schools

S. No.	Programs	Schools
1.	B.Tech. Mechanical Engineering B.Tech. Mechanical Engineering (Specialization in Automobile Engineering) B.Tech. Civil Engineering B.Tech. Nanotechnology	Electrical and Computer Science Engineering, Chemistry, Physics & Materials Science, Biological and Environmental Sciences
2.	M.Tech. Mechanical Engineering M.Tech. Civil Engineering	Biological and Environmental Sciences

b) Interdisciplinary Joint Programs

Table MC02: Joint programs run by School of Mechanical and Civil Engineering

S. No	Programs	School
1.	B.Tech. Nanotechnology	School of Physics & Materials Science

6. Courses in collaboration with other universities, industries, foreign institutional, etc.

Table MC03: List of Courses in collaboration with other universities/ industries

Courses	University / Industry
Blended MOOC	IIT Bombay
Semester exchange program	Suwon University and Gachon University, Korea
B.Tech. Mechanical (Specialization in Automobile Engineering)	Anand Automotive Ltd.

7. Details of programs discontinued, if any, with reasons - Nil

8. Examination System: Annual/Semester/Trimester/Choice Based Credit System

- Since its inception, School of Mechanical and Civil Engineering follows semester and OCGPA grading system.
- From the session 2015-16 the School has adopted Choice Based Credit System as per UGC guidelines.

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

Yes, the School is actively exchanging faculty in programs run by other Schools. Since the university is moving towards Choice Based Credit System, the School has decided to offer different electives which would generate the interest of students from other disciplines. Following is the list of courses or electives taught by School of Mechanical and Civil Engineering.

Table MC04: Participation of School in Courses offered by Other Schools

Sr. No.	Courses	Name of Program	Name of School
1	Refrigeration and air conditioning	B.Tech. (Food Technology)	Applied Science and Biotechnology
	Heat and Mass Transfer		
2	Total Quality Control	B.Tech.(CSE)	Electrical & Computer Science Engineering
3	Basic Mechanical Engineering	B.Tech.(EE)	
4	Engineering Graphics Drawing	B.Tech.(ECE)	
5	Workshop Technology	B.Tech.(BI)	

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

Following are the posts sanctioned and filled in School of Mechanical and Civil Engineering as per UGC norms:

Table MC05: Posts sanctioned and filled as per UGC norms

Posts	Sanctioned	Filled
Professor	4	2
Associate Professor	8	5
Assistant Professor	48	42
Total	60	49

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

a) Faculty members from School of Mechanical and Civil Engineering

School of Mechanical and Civil Engineering has experienced doctoral and post-graduate faculty members with expertise in different fields. Following is the list of faculty members for School of Mechanical and Civil Engineering:

Table MC06: List of current faculty for School of Mechanical and Civil Engineering

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D. / M. Phil. students guided in the last 4 years
Prof. P.L.Goel	M.Tech	Professor	Geo Technical Engineering	44	Guiding 4 M.Tech
Dr. Muneesh Sethi	Ph.D.	Professor	Heat Transfer	17	Guiding 4 Ph.D 4 M.Tech
Er. Anil Mittal	M.Tech	Associate Professor	Irrigation & Hydraulic Engineering	33	--
Er. Viswa Mohan Pedagogu	Ph.D. (Pursuing)	Associate Professor	Production Engineering	21	--
Er. Bhaskar Goel	Ph.D. (Pursuing)	Associate Professor	Production Engineering	23	--
Dr. Atul Pandey	Ph.D	Associate Professor	Solid State Physics	11	--
Dr. Rajesh Kumar	Ph.D	Associate Professor	Solar Energy	16	--
Dr.Priyadarshi Upadhyaya	M.Tech, Ph.D.	Assistant Professor	Advanced Surveying and Remote Sensing	7	Guiding 2 M.Tech
Er. Robin Thakur	Ph.D. (Pursuing)	Assistant Professor	Hydro Turbine	9	--
Er. Abhilash Pathania	Ph.D. (Pursuing)	Assistant Professor	Production Engineering	12	--
Er. Avatar Singh	Ph.D Pursuing	Assistant Professor	Cloud Computing	12	Guiding 3 M.Tech
Dr.Anil Kumar	Ph.D.	Assistant Professor	Thermal	6	--
Dr. Ranchan Chauhan	Ph.D.	Assistant Professor	Thermal Engineering Heat Transfer	3	Guiding 2 M.Tech 2 Ph.D

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D. / M. Phil. students guided in the last 4 years
Dr. Alok Darshan Kothiyal	Ph.D.	Assistant Professor	Fluid Dynamics	5	--
Dr. Amita	Ph.D. (Botany)	Assistant Professor	Nano-biotechnology	--	--
Er. Amar Raj Singh	Ph.D. (Pursuing)	Assistant Professor	Machine Design	12	--
Er. Sanjay Garg	Ph.D. (Pursuing)	Assistant Professor	Construction Technology & Management	24	--
Dr. Virendar Pratap	Ph.D. Pursuing	Assistant Professor	Hard Magnetic Materials	10	--
Er. Nitin Kumar	Ph.D. (Pursuing)	Assistant Professor	Production Engineering	3	--
Er. Raj Kumar	Ph.D. (Pursuing)	Assistant Professor	Manufacturing Engineering	11	--
Ms. Deepika Jamwal	Ph. D pursuing	Assistant Professor	Nano Technology	2	--
Er. Sunil Pathania	M. Tech	Assistant Professor	Mat lab	2	Guiding 2 (M.Tech)
Er. Namita Gandotra	M.Tech	Assistant Professor	Operating Systems	3.5	--
Er. Anshul Sehgal	M.Tech.	Assistant Professor	Machine Design	5	--
Er. Sorabh Aggarwal	M.Tech.	Assistant Professor	Machine Design	4	--
Er. Divyadeep	M.Tech.	Assistant Professor	Fluid Dynamics	1	--
Er. Shashank Sood	M.Tech.	Assistant Professor	Thermal Engineering	--	--
Er. Adit Rana	M.Tech.	Assistant Professor	Fluid Dynamics	0.6	--
Es. Vaishali Dogra	M.Tech.	Assistant Professor	Thermal Engineering	0.6	--
Er. Balkrishan Ramta	M.Tech.	Assistant Professor	Heat Transfer	--	--
Er. Prashant Shukla	M.Tech.	Assistant Professor	Thermal Engineering	--	--
Er. Amar Rao	MBA, B.Tech	Assistant Professor	Finance	4	--

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D. / M. Phil. students guided in the last 4 years
Er. Sharad	MS – IT, B.Sc. (Marine Engineering)	Assistant Professor	Marine Engineering	6	--
Er. Het Ram Kashyap	MCA	Assistant Professor	Operating Systems	2	--
Er. Mahinder Singh	MCA	Assistant Professor	Software Engineering	2	--
Er. Sanjay Bhardwaj	M.Tech.	Assistant Professor	Embedded System	16.6	--
Er. Sumit Mehlwal	M.Tech.	Assistant Professor	Machine Design	5	--
Er. Sakshi Anand	M.Tech	Assistant Professor	Wireless Sensors	3	--
Er. Sashank Thapa	M.Tech.	Assistant Professor	Designing (CAD)	4	Guiding 2 M.Tech
Er. Akshay Pathania	M.Tech.	Assistant Professor	Designing (CAD/CAM)	1	Guiding 1M.Tech
Er. Devina Rattan Paul	M.Tech.	Assistant Professor	Environmental	3	--
Er. Sunita	M.E	Assistant Professor	Water Resource Engineering	--	--
Er. Sahil Sharma	M.Tech.	Assistant Professor	Water Resource Engineering	--	--
Er. Nitin Goyal	M.Tech.	Assistant Professor	Civil Engineering	--	--
Er. Devender Thakur	M.Tech.	Assistant Professor	WSN	1	--
Er. Harjinder Singh	M.Tech.	Assistant Professor	Civil Engineering	--	--
Er. Arunava Poddar	M.Tech.	Assistant Professor	Civil Engineering	1	--
Er. Vinay Kumar	M.Tech.	Assistant Professor	Power System Electrical	3.6	Guiding 2 (M.Tech)
Er. Sumit Mehta	M.Tech.	Assistant Professor	Thermal Engineering	--	--
Mr. Arvind Nanda	BSc. Engg and IIM Bangalore	Director General	Management and Automotive	38	--

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

To enhance global competency and professionalism among students, School of Mechanical and Civil Engineering involves visiting faculty to train the

students in specialized areas of Engineering. Following is the list of visiting faculty for School of Mechanical and Civil Engineering:

Table MC07: List of senior Visiting Fellows, adjunct faculty, emeritus professors.

Category	Name	Organization
Visiting Faculty	Mr. Rajinder Abhange	Chief Technical Officer , Gabriel India Ltd
Visiting Faculty	Mr. S. Acharya	Chief Training officer, Anand University
Visiting Faculty	Mr. Pravesh Srivastava	Group President , Anand Automotive Ltd
Visiting Faculty	Maj Gen A K Chaturvedi (Retd)	Ex Indian Army
Visiting Faculty	Dr. Hyoungh In Lee	Professor, Seoul National University, South Korea
Professor of Eminence	Dr.Subash Chander	MD & CTO, Connecticut Clean Energy Fund
Professor of Eminence	Dr. S.R. Prabhakar	PEC University, Chandigarh
Professor of Eminence	Dr. J.P. Soni	Punjab Agriculture university, Ludhiana

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

14. Program-wise Student Teacher Ratio:

- B. Tech. :15.08:1
- M. Tech. :12:1

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

Table MC 08: List of Academic support and administrative staff

S. No.	Staff	Sanctioned	Filled	Actual
1.	Support Staff (Technical)	11	11	11
2.	Support Staff (Administrative)	6	6	6

16. Research thrust areas as recognized by major funding agencies.

The research philosophy of the School is to attain global standards and emerge as an internationally renowned center for research. The School seeks

to be a research driven institute to develop innovative technologies. Following five research thrust areas have been identified:

- **Renewable energy** :Steam cooking project (funded by MNRE) , Solar still, Solar Air Heater, Solar dryer
- **Himalayan diversity and sustainability**: Remote Sensing and G.I.S., Advance Surveying using Total Station and G.P.S.
- **Nano Technology** : Development of Sensor materials, Water Purification
- **Drip Irrigation**
- **Earthquake resistant design of structures.**

17. Number of faculty with ongoing projects from a) national b) international funding agencies and c) Total grants received. Give the names of the funding agencies, project title and grants received project-wise. 01

a) National Projects:

Faculty from School has been successful in getting grants on projects on the areas aligned with the university research philosophy. Following is the project granted by funding agencies to faculty and students:

Table MC 09: List of faculty projects

S. No.	Project Name	Name of PI	Collaborator	Amount
1.	Steam Cooking	Dr. Muneesh Sethi	MNRE	INR 24,02100

18. Inter-institutional collaborative projects and associated grants received

a) National collaboration

The School of Mechanical and Civil Engineering values collaborative projects with other institutes or industry. The School has initiated collaborations and intends to encourage such tie-ups at a higher level. Following is the list of collaborative projects initiated.

Refer point no 17 (Table MC09) above

b) International collaboration- Nil

19. Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, AICTE, etc.; total grants received. – 01

Refer point no 17 (Table MC09) above

20. Research facility / Centre with

- State recognition : Nil

- National recognition :
 - Research Center in Automobile with Anand Automotive Ltd.
 - Research Center in Renewable Energy with MNRE.
 - DRDC research cell DRDO (through Engineering Watch)
- International recognition : Nil

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

- Centre of Excellence in Automobile Engineering sponsored by Anand Automotive Ltd.

22. Publications:

- Number of papers published in peer reviewed journals (national / international) : 42
- Number in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.): In Scopus : 16
- h- index : 0.1
- Citation Index
 - Range / Average : 0-16/0.47
- Impact Factor Range : 0.01-4.2
- SNIP: - Nil
- SJR: - Nil

Number of papers published in peer reviewed journals (national / international) – 42

1. Sethi M, Thakur N.S., Varun(2012) Correlations for Solar Air Heater Duct with Dimpled Shape Roughness Elements On Absorber Plate, *Solar Energy* Vol 86, Page No.2852-2861
2. Sethi M, Thakur N.S., Varun (2012) Heat transfer and friction characteristics of dimple shaped roughness element arranged in angular fashion (arc) on absorber plate of solar air heater, *Journal of Renewable and Sustainable Energy (AIP)*.Vol 4, page no. 212-231
3. Kumar A, Sethi M, Kumar K, Khurana S, Pathania A.(2013) Computational Fluid Dynamics Based Analysis of Angled Rib Roughened Solar Air Heater Duct, *International Journal of Thermal Technologies* vol 3.
4. Kumar K, Sethi M, Khurana S, Scope of Geothermal Energy Usage for Air Conditioning in Buildings, *IJMPRD* Vol 1,Page No. 2315-4489.
5. khurana S, Goel V, Kumar K, Sethi M, Kumar S.(2013) Particle impaction and flow through an infinite array of cylinders, *Walailak Journal Of Science & Technology Vol. 11,Page no. 537-549*

6. Sethi M, Khurana S, Goel V. Silt erosion study on the performance of an impulse turbine in small hydropower, Ambient energy, *Taylor & Francis (Accepted)*
7. Chauhan R, Thakur NS.(2014) Investigation of the thermohydraulic performance of impinging jet solar air heater, *Energy (Elsevier)* Vol.68,Page No.1-7.
8. Singh T, Patnaik A, Gangil B, Chauhan R.(2015) Optimization of tribo-performance of brake friction materials: Effect of nano filler, *Wear (Elsevier)* Vol.10,Page No.324-325
9. Pathania A, Thakur P, Sharma A, Hsu JH, Thakur A.(2015) Investigation of iron deficient and manganese doped Ni – Mg nano-ferrooxide ceramics, *Ceramics International (In Press)*
10. Thakur SS, Pathania A, Thakur P, Thakur A (2015) Hsu JH. Improved structural, electrical and magnetic properties of Mn–Zn–Cd nanoferrites, *Ceramics International* Vol. 41 Page No.5072-5078
11. Pedagogu VM, Kumar M. (2013) The Conventional Extraction Of Features From Intricate Prismatic Part For Computer Aided Process Planning System (Capps) *International Journal of Mechanical Engineering (IJME)*, Vol.2,Page No. 51-58
12. Pedagogu VM, Khannaji P.(2013) A novel approach to design and fabrication of thermo-acoustic refrigerator using high amplitude sound waves, *IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)*, Vol.3 Page No.165-172.
13. Pedagogu VM.(2014) CFD Based Analysis Of Heat Transfer And Friction Characteristics Of Broken Multiple Rib Roughened Solar Air Heater Duct, *International Journal of Mechanical and Production Engineering Research and Development (IJMPERD)*, Volume 8 Page No.15-24
14. Pedagogu VM, (2014) Kumar M. Contemporary Inclination in Capp Systems for Prismatic Parts, *IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)*, Vol 4.
15. Pedagogu VM, Kumar M,(2014) An Outline of 2.5 Dimensional Prismatic Parts Machining, Intelligent Control and Automation, Vol.4 Page No.183-189
16. Upadhyay P, Ghosh SK, Kumar A.(2013) Temporal MODIS Data for Identification of Wheat Crop using Noise clustering Soft Classification Approach. *Geocarto International (Taylor & Francis)*
17. Upadhyay P, Ghosh SK, Kumar A.(2014) Entropy Based Noise Clustering Soft Classification Method for Identification of Wheat Crop using Time Series MODIS Data. *Agro-Geoinformatics 2014*, IEEE Xplore database, Beijing, China, <http://dx.doi.org/10.1109/Agro-Geoinformatics.2014.6910670>.
18. Singh VP, Kumar G, Shah J, Kumar A, Kotnala RK, Singh M. (2015) Investigation of super-exchange interactions in BaHoxFe12-

- xO₁₉ ($0.1 \leq x \leq 0.4$) nanohexaferrites and exploration at ultra high frequency region, *Journal of Ceramics International* (Accepted))
19. Kumar G, Shah J, Kotnala RK, Singh VM, Dhiman M, Shirsath SE, Shahbuddin M, Khalid M. Batoo, M.Singh.(2015) Mössbauer spectroscopic analysis and temperature dependent electrical study of Mg_{0.9}Mn_{0.1}Gd_yFe_{2-y}O₄ nanoferrites, *Journal of Magnetism and Magnetic Materials*.
 20. Singh VP, Kumar G, Kotnala RK, Shah J, Sharma S, Daya KS, Khalid M, Batoo, Singh M.(2015) Remarkable magnetization with ultra-low loss BaGd_xFe_{12-x}O₁₉ nanohexaferrites for applications up to C-band, *J. Magn. Magn. Mater.*, Vol.37 Page No.478–484.
 21. Singh VP, Kumar G, Dhiman P, Kotnala RK, Shah J, Khalid, Batoo, Singh M.(2014) Structural, dielectric and magnetic properties of nanocrystalline BaF₁₂O₁₉ hexaferrite processed via sol-gel technique, *Advanced Materials Letters*, Vol.5 Page No. 447
 22. Kumar G, Shah J, Kotnala RK, Dhiman P, Rani R, Singh VP, Garg G, Shirsath SE, Khalid MS, Batoo M, Singh M.(2014) Self-ignited synthesis of Mg-Gd-Mn nanoferrites and impact of cation distribution on the dielectric properties, *Ceram. Inter*, Vol. 40 Page No. 14509
 23. Kumar G, Shah J, Kotnala RK, Singh VP, Sarveena, Garg G, Sagar E, Shirsath, Khalid M, Batoo, Singh M.(2014) Superparamagnetic behavior and evidence of weakening in super-exchange interactions with the substitution of Gd³⁺ ions in the Mg-Mn nanoferrite matrix, *Materials Research Bulletin*, (Revision Submitted)
 24. Gupta D, Singh D, Kothiyal NC, Saini AK, Singh VP, Pathania D. (2015) Synthesis of chitosan-g-poly(acrylamide)/ZnS nanocomposite for controlled drug delivery and antimicrobial activity, *International Journal of Biological Macromolecules* Vol. 74 Page No. 547–557
 25. Verma KC, Singh VP, Mast Ram, Shah J, Kotnala RK,(2011) A structural, micro structural and magnetic properties of NiFe₂O₄, CoFe₂O₄ and MnFe₂O₄ multiferroic thin films, *J. Magn. Magn. Mater.*, Vol.23 Page No.3271
 26. Kothiyal AD.(2014) The vorticity of unsteady mhd free convection flow through porous medium with heat and mass transfer past a porous vertical moving plate with heat source/sink, *Chemical and Process Engineering Research* Vol.21 Page No.52-59.
 27. Kothiyal AD. A study of vorticity of mhd visco-elastic boundary layer flow through porous medium with free convection past a continuous moving, *International Journal of Scientific & Engineering Research*. Volume 4, page52-57.
 28. Kothiyal AD.(2015) A note on vorticity of unsteady mhd free convection and mass transfer flow of visco-elastic fluid through porous medium with constant suction and heat flux, *IOSR Journal of Mathematics (IOSR-JM)* Vol.21, page38-45

29. Kothiyal AD. (2013) A note on vorticity of mhd flow of continuously moving vertical surface with uniform heat and mass transfer. *International Journal Of fluid Mechanics*. Vol. 4(1) .
30. Kothiyal AD.(2013) A note on vorticity of unsteady mhd free convective and mass transfer flow through porous medium in rotating system, *International Journal of Mathematica*. Vol. 1, Issue (1)
31. Goel B, Singh S, Sarepaka RV.(2014) Optimizing Single Point Diamond Turning for Mono-crystalline Germanium Using Grey Relational Analysis, *Materials and Manufacturing Proicesses*(in Press).
32. Kumar R, Aggarwal RK, Sharma JD (2012) “Solar radiation estimation using artificial neural network: A review”, *Asian Journal of Contemporary Sciences*, Vol.1, Page No. 12-17, 2012.
33. Kumar R, Aggarwal RK, Sharma JD, Pathania S (2012), “Predicting energy requirement for cooling the building using artificial neural network”, *J.Technol. Innov. Renew. Energy*, Vol.1(2) Page No. 113-121.
34. Kumar R, Aggarwal RK, Gupta D, Sharma JD (2013), “Carbon emissions from air- conditioning”, *American Journal of Engineering Research*, Vol.2 (4)Page No. 72-74.
35. Kumar R, Aggarwal RK, Sharma JD (2013) “Predicting energy requirement for heating the building using artificial neural network”, *International Journal of Development Research* Vol.3(5) Page No.14-19.
36. Kumar R, Aggarwal RK, Gupta D, Sharma JD (2013), “Predicting Total Solar Heat Gain of the Building Using Artificial Neural Network”, *International Journal of Modern Engineering Research*, Vol. 3 (3)Page No. 1606-1609.
37. Kumar R, Aggarwal RK, Gupta D, Sharma JD (2013) “Predicting total ventilation losses of the building using artificial neural network”, *International Journal of Engineering Research-Online*, Vol.1 (1),Page No. 61-68.
38. Kumar R, Aggarwal RK Sharma JD (2013) “Energy analysis of a building using artificial neural network: A review”, *Energy and Buildings*, Vol.65 Page No. 352-358.
39. Kumar R, Aggarwal RK, Sharma JD (2013) “New regression model to estimate global solar radiation using artificial neural network”, *Advances in Energy Engineering (AEE)*, Vol. 1 (3) Page No. 66-73, .
40. Kumar R, Aggarwal RK, Gupta D, Sharma JD (2013) “Predicting total conduction losses of the building using artificial neural network”, *Energy and Environmental Engineering*, Vol.1 (1) Page No. 1-4.
41. Kumar R, Aggarwal RK, Sharma JD, “Predicting total energy load of building using artificial neural network” *Energy and Environmental Engineering*, Vol.1 (2) Page No. 25-35.

42. Kumar R, Aggarwal RK, Sharma JD, Pathania S(2014) “New Artificial Neural Network Model for Precise Estimation of Global Solar Radiations for Indian Locations”, *International Journal of Green Energy*, (Accepted).

- **Monographs** : Nil
- **Chapters in Books** : Nil
- **Edited Books** : Nil
- **Books with ISBN with details of publishers:**

Table MC10: List of Books Published by the Faculty

Title of the book	Author Name	Publishers	ISBN
Machining Productivity Improvement	Bhaskar Goel	Lambert Academic Publishing Germany	978-3-659-38961-0
Power Generation from MSW of Solan city.	Robin Thakur	Lambert Academic Publishing Germany	978-3-659-46510-9

23. Details of patents and income generated : 01

School has initiated following patents

Table MC11: List of Patents

S. No	Inventors	Title of the Invention	Patent Filing No
1.	Er. Saurabh Aggarwal	Flying Wheel Chair – For evacuation purposes.	Submitted for filling

24. Areas of consultancy and income generated :

School is providing consultancy in following areas to industry:

Table MC12: List of Consultancy Projects

S. No.	Name of PI	Title/Area	Amount	Funding Agency
1.	Amar Raj Singh Suri	Design of suspension systems in Automobiles	Rs. 10 Lakhs	Gabriel India Ltd
2.	Prof. P.L. Goel	Design, third party quality assurance and testing of civil structures of Govt. projects.	To be determined	Everon project consultants

Faculty members from the School of Mechanical and Civil Engineering provide consultancy services in their areas of expertise as given below:

Table MC13: Consultancy Services by Faculty Members

S. No.	Faculty	Consultancy Topic	Institute/ Organization
1.	Amar Raj Singh Suri	Reverse Engineering	Bells Institute, Shimla.
2.	Abhilash Pathania	Latest Trends in Automobile Engg.	Bells Institute, Shimla.
3.	Shard	Non – Verbal communication in a short term program on communication skills for Effective Curriculum Implementation	Govt. Polytechnic for Women, Kandaghat - Solan

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

Faculty members have been selected to visit other labs and institutes to attend various training programs. Following is the list of such programs attended by the faculty:

Table MC 14: List of faculty visited other laboratories / institutions / industries

S.No.	Faculty Name	Laboratories / institutions / industries
1.	Dr. Ranchan Chauhan	IIT Kharagpur
2.	Mr. Arvind Nanda	IIT Bombay
3.	Dr. Muneesh Sethi	NIT Hamirpur
4.	Mr. Bhaskar Goel	CSIR-CSIO, Chandigarh

26. Faculty serving in

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

Table MC15: List of faculty members serving as experts in committees, resource persons, journal reviewers.

S. No.	Name of faculty Member	Role
1.	Dr. Muneesh Sethi	Reviewer of Solar Energy Journal - Elsevier publications
2.	Dr. Priyadarshi Upadhyay	Reviewer of Geocarto International- Taylor and Francis publications

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

Faculty members from the School of Mechanical and Civil Engineering have actively participated in various refresher courses, conferences, workshops, orientation and training programs organized by different national and international organizations. Following is the list of different programs attended by our faculty:

Faculty Development Programs/ Refresher courses/ Workshops/ conferences/ orientation programs/ training programs:

- Mr. Virender Pratap presented poster in International Conference on Emerging Trends in Basic & Applied Sciences, 2-3May 2015 at Maharaja Agarsen University Baddi.
- Dr. Muneesh Sethi presented paper in International Conference on Emerging Trends in Basic & Applied Sciences, 2-3May 2015 at Maharaja Agarsen University Baddi.
- Mr. Akshay Pathania presented paper in International Conference on Emerging Trends in Basic & Applied Sciences, 2-3May 2015 at Maharaja Agarsen University Baddi.
- Mr. Bhaskar Goel attended a Workshop on “Diamond Turning” on 20-21st April 2015 at CSIO
- A Workshop on “Fluid Mechanics” was held at Shoolini University on 20-30th May 2014 IIT Kharagpur
- National conference on “Recent advances in Renewable Energy” was held at Shoolini University on 8-9th June 2013
- Mr. Vinod Kumar attended workshop on “Recent Advancement in Manufacturing Technology” 10-21st June 2013, GNE, Ludhiana
- A Workshop on “Engineering Thermodynamics” was held at Shoolini university on 11-21st Dec 2012 conducted by IIT Mumbai

Following is the list of faculty recharging programs at university level.

Table MC16: List of faculty recharge programs.

S. No.	Topic	Year	Resource Person
1	Thesis & Paper Writing	2015	Dr. Klaus von Gabow, University of Germany
2	Personality Development	2015	Prof. B. L. Dubey, University of Alaska, and Director SIS, Anchorage, USA
3	eUniv-LMS	2014	Ms Flourence Martin, Associate Professor, University of North Carolina, USA
4	Spiritual Leadership- I & II	2014	Mr Rajendra Abhange, Senior Director Technology, Gabriel India
5	Curriculum Development	2014	Ms Pooja Gupta, Consultant Higher Education
6	Faculty Development Program	2014	Dr. Manish Pandey, Cambridge Certified Faculty Developer and Trainer
7	Research Writing	2013	Ms Andrea Wright, Brown University, USA
8	eUniv	2013	Mr. Kamal Kant, Shoolini University

28. Student projects

- percentage of students who have done in-house projects including interdepartmental projects 100%
- percentage of students doing projects in collaboration with other universities / industry / institute : NA

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

○ **Faculty**

- Dr. Muneesh Sethi delivered a lecture as a Keynote speaker in International Conference on Emerging Trends in Basic & Applied Sciences at Maharaja Agarsen University on 2nd May 2015.
- Dr. Muneesh Sethi chaired a session in International Conference on Emerging and Futuristic Trends in Engineering & Technology at Maharaja Agarsen University on 9th May 2015.

- Dr. Muneesh Sethi chaired a session in International Conference on Mathematics & Engineering Sciences in Engineering & Technology at Chitkara University on 20th March 2014.
- Dr. Priyadarshi Upadhyay chaired a session in an International conference, Agro-geoinformatics 2014, Beijing, China 2014. Awarded travel grant of sum 1 lakh 7 thousand from Science Engineering and Research Board, Department of Science and Technology, Govt. of India, for the same.
- Mr. Sharad got letter of appreciation for delivering a talk on Non – Verbal communication in a short term program on communication skills for Effective Curriculum Implementation organized by National Institute of Technical Teachers Training, Chandigarh, 9 – 11 June, 2015.

○ **Doctoral / post-doctoral fellows: 01**

- Dr. Anil Kumar is doing Post Doctoral fellowship from Kyungpook National University Daegu South Korea.

○ **Students :** Nil

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

Table MC 17: List of Workshops conducted

S.NO	Work Shop Name	Date	Sponsored by
1	Engineering Thermodynamics	11 th -21 st Dec 2012	IIT Mumbai
2	National conference on recent advances in renewable energy	7-8 th June 2013	Shoolini university
3	Fluid Mechanics	20 th -30 th May 2014	IIT Kharaghpur

31. Code of ethics for research followed by the department.

Yes, School follows the IEEE code of Ethics

32. Student profile program-wise:

Table MC18: Program-wise pass percentage

Name of the program	Academic Year	Applications received	Selected		Pass Percentage	
			Male	Female	Male	Female
B.Tech (ME)	2010-11	80	77	0	81%	-
B.Tech (ME)	2011-12	135	96	0	-	-

Name of the program	Academic Year	Applications received	Selected		Pass Percentage	
			Male	Female	Male	Female
B.Tech (ME)	2012-13	158	112	2	-	-
B.Tech (ME)	2013-14	123	77	1	-	-
B.Tech (ME)	2014-15	45	41	0	-	-
B.Tech (CE)	2011-12	85	58	11	-	-
B.Tech (CE)	2012-13	91	60	13	-	-
B.Tech (CE)	2013-14	77	45	5	-	-
B.Tech (CE)	2014-15	40	33	4	-	-
B.Tech (ME)	2012-13 – L	40	31	5	-	-
B.Tech (ME)	2013-14 – L	43	32	8	-	-
B.Tech (ME)	2014-15 – L	42	32	7	-	-
B.Tech (CE)	2012-13 – L	16	9	5	-	-
B.Tech (CE)	2013-14 – L	18	11	3	-	-
B.Tech (CE)	2014-15 – L	26	18	5	-	-
M.Tech (ME)	2013-14	3	2	1	-	-
M.Tech (ME)	2014-15	7	5	0	-	-
M.Tech (CE)	2014-15	6	5	0	-	-
M.Tech (CE)	2014-15 – I	1	1	0	-	-
M.Tech (Env Sc)	2012-14	1	0	1	-	100%
Ph. D(ME)	2013-14	5	3	0	-	-
Ph. D(ME)	2014-15	4	3	0	-	-

33. Diversity of students:

TABLE MC19: Program-wise data for diversity of students

Name of the Program (refer to question no. 4)	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
B.Tech.ME(2010-14)	None	89%	11%	None
B.Tech.ME(2011-15)	None	81%	19%	None
B.Tech.ME (2012-15)	None	84%	16%	None
B.Tech.ME(2013-17)	None	78%	22%	None
B.Tech.ME(2014-18)	None	90%	10%	None
B.Tech.CE(2011-15)	None	89%	11%	None
B.Tech.CE(2012-16)	None	95%	5%	None
B.Tech.CE(2013-17)	None	93%	7%	None
B.Tech.CE(2014-18)	None	91%	9%	None
M.Tech.ME(2013-15)	None	None	100%	None
M.Tech.ME(2014-16)	16.6 %	50%	33.4%	None
M.Tech.CE(2012-14)	None	100%	None	None
M.Tech.CE(2014-16)	None	100%	None	None

Name of the Program (refer to question no. 4)	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
Ph.D.ME(2013)	None	None	100%	None
Ph.D.ME(2014)	None	33%	67%	None

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

Since barely two batches of B.Tech. Mechanical Engineering and One Batch of B.Tech. Civil Engineering have passed out of the School so far, more such successes are expected in the forthcoming batches.

- 35. Student progression**

Table MC20: Data for student progression within university

Student progression	Percentage against enrolled
UG to PG	10 %
PG to Ph.D.	Nil
Ph.D. to Post-Doctoral	NA
Employed	
Campus selection	75%
Other than campus recruitment	15 %
Entrepreneurs	Nil

- 36. Diversity of staff**

Table MC21: Diversity of staff

Percentage of faculty who are graduates	
of the same university	11%
from other universities within the State	27%
from universities from other States	58%
from universities outside the country	04%

- 37. Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period. :**

Following are the faculty members who were awarded Ph.D. degree during the assessment period:

Table MC22: List of faculty members awarded Ph.D. degree during assessment period

Sr.No	Name of the faculty	Course	Awarded year
1	Dr. Muneesh Sethi	Ph.D.	2013
2	Dr. Saurabh Khurana	Ph.D.	2014
3	Dr. Ranchan Chauhan	Ph.D.	2014
4	Dr. Priyadarshi Upadhyaya	Ph.D.	2014

38. Present details of departmental infrastructural facilities with regard to:

a) Library :

The School utilizes the fully digitized Central library of the University where faculty and students get both formal and ‘out-of-classroom’ learning through the Learning Management System (LMS) and Knowledge Management System (KMS). Moreover it also extends the reach of Shoolini University’s online platform (eUniv). Here, magazines, journals and newspapers are provided to encourage the habit of reading among students.

Moreover, the School has its own library, which is linked to the Central Library. Here, we have kept minimum physical books and journals and, the School library is more in the form of a ‘virtual’ library. Following books and journals are available for students in the library:

- Total Books Volumes available : 11819
- Reference Books : 722
- Print Journals : 48 + 9000
(Combined science, technology and management)

b) Internet facilities for staff and students

- Wi-Fi connectivity & LAN

- c) Total number of class rooms** : 10
- d) Class rooms with ICT facility** : All
- e) Students’ laboratories** : 19 + 1 workshop

Table MC23: List of student's laboratories

Sr. No.	Lab name	Application
1.	Heat Transfer Lab	Study of mechanisms of heat transfer: Conduction, Convection, Radiation
2.	Hydraulic Machines Lab	Study of turbines and pumps used to generate power
3.	Refrigeration and Air Conditioning Lab	To study the coefficient of performance of refrigerating and air conditioning systems
4.	Internal Combustion Engines Lab	Study of engines of automobiles 2 stroke, 4 stroke, petrol engine, diesel engine
5.	Automobile Lab	Cut section models of automobile parts to study their functioning
6.	Kinematics of Machines Lab	Kinematics of machine parts
7.	Dynamics of Machines Lab	Dynamics of machine parts
8.	Strength of Materials Lab	Testing of manufactured parts
9.	Mechanical Vibrations Lab	Understanding the practical aspects of vibration in engineering systems and its control
10.	Computer Aided Design/CAM lab	Understanding the concepts of CAD/CAM/CAE using softwares like CREO.
11.	AutoCAD Lab	Understanding the concepts of 2D drafting using AutoCAD
12.	Material Science Lab	Study of microstructure of different materials
13.	Survey lab	Use of modern instruments like total station and Electronic theodolite etc.
14.	Building materials & concrete lab	Testing of building materials, their durability of concrete cube testing and initial and final setting time of cement etc.
15.	Soil mechanics lab	Testing of soil regarding permeability, plastic limit etc.
16.	Highway engineering lab	Testing of bitumen, Flash point, crushing value, abrasion test etc.

Sr. No.	Lab name	Application
17.	Structural analysis lab	Study of 2 hinged and 3 hinged arch, moment deflection method
18.	Structure mechanics lab	Study of bonds in brickwork, doors, stairs & beams etc.
19.	Rock mechanics lab	Study of sample of rocks, minerals, folds & faults etc.
20.	Workshop	Machine Shop, Welding Shop, Fitting Shop, Carpentry Shop

f) Research laboratories : 04

Table MC24: List of research laboratories

Lab Name	Applications
Solar Energy	Solar air heater,solar dryer,solar still
Building Materials and concrete lab	Blending of and innovation in materials
Environmental engineering lab	Study of ph value of water, BOD & COD, turbidity, alkalinity of water sample etc.
Fluid Mechanics Lab	Studies related to fluid motion

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

(a) Doctoral Students from the host institution/university(Doctoral) :

Table MC25: List of doctoral students from Shoolini University

Name of the candidate	Research Area	Research Supervisor
Abhilash Pathania	Nanotechnology	Dr Atul Thakur
Raj Kumar	Solar Energy	Dr. Muneesh Sethi
Robin Thakur	Renewable Energy	Dr. Muneesh Sethi
Amar Raj Singh Suri	Design	Dr. Muneesh Sethi
Nitin Kumar Sharma	Solar Energy	Dr. Muneesh Sethi
Ashok Kumar	Solar Energy	Dr. Ranchan Chauhan

(b) Doctoral student from other institutions/universities (Doctoral)

Table MC26: List of doctoral students from other University

Name of the candidate	Research Area	Research Supervisor
Bhaskar Goel	Diamond Turning	Dr. Sehijpal Singh
Virender Pratap	Magnetic Nano Materials	Dr. Mahavir Singh

40. Number of post graduate students getting financial assistance from the university. - 07

Several UG and PG students receive financial assistance from the university. Following is the list of PG/Ph.D. students who have received financial assistance from the university:

Table MC27: List of PG and Ph.D. students getting financial assistance from university

Sr. No.	Name of Student
1	Mr. Nitin Kumar Sharma
2	Mr. Amar Raj Singh Suri
3	Mr. Abhilash Pathania
4	Mr. Robin Thakur
5	Mr. Raj Kumar
6	Mr. Adit Rana
7	Ms. Vaishali Dogra

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

Yes, the need for new programs and courses is assessed from the time to time. Dean of the Faculty proposes new programs on basis of inputs from the external stake holders including the potential employers, alumni and academicians. Internal inputs are taken from faculty of the School and students. The proposal is put forward to Board of Studies (BOS) which evaluates and assesses the programs based upon the inputs taken around the parameters of employability and global scenario in the profession. Based upon the analysis of BOS, Academic Council considers the approval of new program.

42. Does the department obtain feedback from:

a) Faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

Yes, feedback of the faculty is taken on curriculum development and teaching-learning evaluation. Departmental Curriculum Committee has been constituted as per the directions of Academic Council which includes all the faculty members and experts from industries. The committee under the chairmanship of Dean meets periodically to discuss the curriculum, teaching-learning-evaluation and research issues. Following initiatives have been taken in the department as per the recommendations of the committee:

- New program Automobile Engineering in collaboration with Anand group has been introduced.
- New courses like persona enhancement, Aptitude Development, etc introduced
- Improved pedagogy- case study method and online study material through eUniv

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

Yes, student's feedback is taken at the closing of every semester. A well-structured format is used for collecting students' feedback regarding the faculty teaching & evaluation, curriculum etc. Students' feedback is taken as the basis for introducing a new course/program, development and redesigning of curriculum at School level and for development of the University at large. Courses like persona enhancement, written and verbal communications and aptitude development have been introduced as per students' feedback.

c) Alumni and employers on the programs offered and how does the department utilize the feedback?

Yes, the department takes Alumni and Employers' feedback on the programs and curriculum offered. Employers' feedback is taken during their visits to the campus for placements of the students, whereas the alumni feedback is taken during the 'Alumni Meet'. Alumni are frequently invited for an interaction with the students during 'SPRINT' program and for their feedback on the academic programs and courses which is incorporated in the revision of curriculum and courses.

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

Since the School is relatively young and only one batch has passed out till date. However, the following list contains names of some of the students

who are on the path of success and will become distinguished alumni in the near future:

Table MC28: List of successful alumni

S. No.	Name	Courses	Year	Company
1	Rakesh Kumar	B. (Tech. Mechanical)	2014	Havells
2	Sahil Thakur	B. (Tech. Mechanical)	2014	Gabriel India Ltd
3	Ankit Duggal	B. (Tech. Mechanical)	2014	Gabriel India Ltd
4	Mohit Gupta	B. (Tech. Mechanical)	2014	GEA
5	Rajneesh Thakur	B. (Tech. Mechanical)	2015	Eclerx
6	Sunil Kumar	B. (Tech. Mechanical)	2015	Eclerx
7	Shivam Chawla	B. (Tech. Mechanical)	2015	Eclerx
8	Rajat Sharma	B. (Tech. Mechanical)	2015	Gabriel
9	Vijay Kumar Sharma	B. (Tech. Mechanical)	2015	Gabriel
10	Shashi Pal	B. (Tech. Mechanical)	2015	Eicher- Volvo

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

The School organizes student enrichment programs regularly involving external experts to enrich the experience of students and inform them about the latest developments. Representative examples of the programs organized involving external experts are listed below:

- CAD / CAM specialized courses like AutoCAD, STAAD – Pro, Pro/e, and CATIA etc.
- Aptitude Development
- Persona Enhancement
- SPRINT Program
- Guru Series lectures
- Special Lecture on Total Quality Control and Maintenance Engg. by Anand Automotive Ltd.

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

The School employs combination of traditional and modern teaching methodologies while encouraging the use of technology. In addition to chalk talk, we are active participant of eUniv, LMS. eUniv helps to provide online teaching material to students. The presentation and analytical skills of students are enhanced through seminar presentations by students. Practical curriculum is linked to the theory courses and equal weightage is given to both practical and theoretical training. Different teaching methods adopted by the faculty for different programs are:

- **Lecture method:** Teaching through lectures by using chalk and talk as well as LCD projectors.
- **Interactive method:** Teaching through conducting debates on the topics related to the subject handling.
- **Project based learning:** Analyzing, designing, implementing and documenting skills of the students are improved by assigning mini-projects, full semester projects.
- **Computer assisted learning:** Quizzes / Assignments are conducted through LMS (Learning Management System)
- **Experimental learning:** The students are trained to do programming through lab experiments.
- **Seminars:** The students are encouraged to take Technical seminar which is used to improve the presentation skills of the students.

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

The objectives and learning outcomes are monitored from time to time through regular assessment tools like:

- Two mid term examinations in each semester
- Surprise tests & quizzes
- Case study discussions
- Student seminar/presentations
- 8 Assignments per semester
- Major and Minor Projects
- Group discussions

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

Our students and faculty members are actively involved in various extension activities. Following is an illustrative list of extension activities organized by the School.

- Awareness program on solar energy in the surrounding villages
- Awareness program on the benefits of Drip irrigation

- One day seminar on “ Importance of Robotics in present age”
- Skill development courses in collaboration with NSDC
- Engineers Day is celebrated every year by organizing various events and lectures to increase awareness about the engineering profession
- 1st year Project Exhibition and competition as a part of Tech fest “MOKSHA 2015”
- Tree Plantation Drive
- Marathon on teachers Day

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

Beyond syllabus scholarly activities are regular feature in the School. The seminars, workshops, conferences, training programs, industrial visits and invited talks, etc. are regularly organized to keep the students well informed about the developments in the field of engineering. The interactions of students with the experts from industry and academia exposes them to the best minds in the field. Faculty members from the School have also delivered guest lectures at different institutes. Details of publications, consultancy, workshops and paper presentations are already provided in point no. 22, 24, 27 and 30.

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

Department has been rated by the different agencies from time to time for its excellence in various fields:

- Adjudged as the Most Upcoming Engineering College in North India', 2014 by ASSOCHAM
- Nodal remote center for IIT Bombay and IIT Kharagpur

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

Faculty is focusing its research effort on solar energy especially solar dryer, solar air heater, solar still and steam cooking. Also the School is working in close interactive partnership with Anand Automotive Ltd. to set up Automotive Centre of Excellence. Civil engineering is focusing its research on analysis of seismic disturbances and risk mitigation measures, soil stabilization by using geotextiles / geomembrane, silt erosion in turbine, Details of collaborations, published research papers, and consultancies are provided in point no. 18, 22 and 24

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

Strengths:

Industry aligned course curriculum

The School has developed and follows curricula aligned to industry for improving students' competence and employability. For instance the course curriculum of specialization in Automobile Engineering has been designed and structured in partnership with industry experts from Anand Automotive Ltd., a leading group in the automobile sector. Eminent persons from industries and top education institutes regularly participate in the curriculum development process to provide a holistic development of students.

Focus on Inclusive development of Students and placements:

The School has included programs like Persona Enhancement and Aptitude building as a part of its curriculum. SPRINT, an accelerated learning program covering both soft and technical skills is conducted proactively for overall development of the students. Students as well as the faculty are actively involved in social and cultural activities to develop leadership traits, foster team work and develop communication skills. The School encourages imparting of application based learning through projects assigned to the students from the first year itself. These measures have gone a long way in ensuring good internships and placements.

Strong mentoring system:

The School has a strong mentoring support system for students. Students are divided into small groups of 8 to 10 each and a teacher is assigned to each group who takes care of their personal as well academics problems. The faculty mentors guide their respective mentees throughout the program and track their progress.

Tie-Ups with Reputed Industries:

The School has established a Centre of Excellence for Automobile Engineering in partnership with leading industries in automotive sector to promote excellence and innovation. B. Tech. Mechanical (Specialization in Automobile Engineering) program has been designed in collaboration with Anand Automotive limited, a leading automobile company in India and they are sponsoring their best diploma holder employees for the 3 year full time B. Tech program at the School every year.

Green Energy Initiatives:

The School has initiated research at P.G and doctoral level in field of renewable energy especially solar as a part of green energy initiatives. A steam cooking plant has been successfully installed in girls' hostel and there is a plan to replicate it in other hostels.

Weaknesses:**International Recognitions and Collaboration:**

The School has been striving to secure international recognitions and collaboration with limited success so far. These efforts are being accelerated pro-actively through the University's 'Office of International Affairs.'

Inadequate research projects and programs

While the School has successfully initiated research programs in the fields of Renewable Energy and Automobile Engineering, similar efforts are required for expanding research activities in other fields.

Limited Student and Faculty Exchange:

Even though several student and faculty exchange programs have been successfully initiated at the university level, the School has yet to effectively participate in such programs.

Limited consultancy projects and external funding

Despite the technological potential and the market that exists, the School has not been able to adequately leverage the opportunities related to external funding and consultancy.

Specializations in PG programs

More specializations need to be offered in PG programs such as Robotics, CAD/CAM/CAE, and Structural Mechanics etc. Such requirements are being addressed by developing these programs and infrastructure, which will be offered under the Choice Based Credit System adopted by the university.

Opportunities:**Academic and Functional Autonomy:**

With considerable academic and functional flexibility available with the University there is opportunity to leverage it by continuously updating the programs with the dynamic demands of the industry. Being recognized as a Tier 1 institute on the basis of this functional autonomy the School has an opportunity and plans to obtain accreditation of its B. Tech programs by NBA and then seek recognition under the Washington Accord.

Research Opportunities for Higher Studies in Collaboration with Foreign Universities:

Shoolini University has tie-ups and collaborations with various global universities for joint research, collaborative centers of excellence and student

and faculty exchange programs. There is a huge untapped opportunity to leverage these collaborations and linkages.

Consultancy and Innovative research

With significant initiatives already having been taken by research at PG and Doctoral level in green energy technologies and implementation of projects related to this field, there is tremendous scope for consultancy work in renewable energy for the welfare of society. Himalayan region offers opportunities of innovative research in areas peculiar to the region, e.g. disaster management, structures, farming techniques etc.

Skill development programs

Government of India is promoting skill development programs under National Skill Development Council (NSDC). While an initiative has been taken by conducting a program on automobile maintenance, large opportunity exists to extend it to other disciplines.

Green Energy

There is a great opportunity for implementing green energy technologies, as there is abundant sunshine throughout the year which is supported by research work in this field at PG and Doctoral level. There is a tremendous scope for consultancy in renewable energy for the welfare of the society.

Challenges:

Global exposure and compatibility

In order to promote frequent and larger two-way participation of students in exchange programs with global universities and institutes, more efforts are required to attract foreign students and also to make our students globally more compatible.

To Raise the Quality of Research Infrastructure to be at par with Global Standards

The School needs to further improve the quality of research infrastructure to be compatible with international standards in order to enhance global collaboration in terms of collaborative research and for student/ faculty exchange programs.

Collaborative Industrial Research Projects

In order to further improve the quality of research, collaborations with the industry have to be strengthened. The School aspires to partner with premier research agencies also to promote such initiatives.

Attracting talented candidates for Ph.D. research.

Finding talented candidates for Ph.D. and research is a challenge for a private institute. There is a need to change this perception by attracting high quality faculty, obtaining more research grants and generating high impact publications

52. Future plans of the department.

Despite a brief history with only the first couple of batches having passed out the School of Mechanical and Civil Engineering is striving to make rapid progress and to be counted amongst the top 50 Engineering Schools of the country in the next 5 years. It has identified the following key milestones to achieve that objective:

Effective pedagogy and course curriculum:

The School endeavors to raise effectiveness of its pedagogy to global standards by further improving the 3 contributing factors, viz. rationalized curriculum structure, excellence in teaching quality and proactive academic collaborations with credible national and international institutes of repute. Course curricula are being restructured to Choice Based Credit System (CBCS), measures are being taken to enhance teaching quality in every respect and collaborations with top institutes like IIT Bombay for Blended MOOCs program and faculty & student exchange programs with Seoul University South Korea and others are being actively pursued.

Strengthening of industrial collaboration

School has already established industrial linkages with organization like Anand Automotive Ltd and more such partnerships will be strengthened and expanded. School intends to start skill development center in collaboration with National Skill Development Corporation for youth empowerment and welfare of society.

To excel in the field of Renewal Energy

School of Mechanical and Civil Engineering has already established center of excellence in the field of renewal energy. The center aims at providing quality postgraduate education to meritorious undergraduates with keen interest in the field of renewal energy. Schools seeks to promote and disseminate knowledge of the various topics and technologies of renewal and alternative energy resources through organizing the international conferences and workshops.

Research focus:

The School recognizes the need to significantly raise its research initiatives and activities by greater involvement of its faculty. It plans to accomplish

this by upgrading its research infrastructure and also by adding more Ph.D.'s and Post docs in the faculty. The University having been recognized a Defense Research & Development Cell has several avenues for Engineering research projects under DRDO. Being located in the Himalayas also provides the School with opportunities to work on innovative research projects related to the environmental sustainability of the region.

To get accredited by NBA and qualify for Washington accord

The School plans to apply for National Board of Accreditation (NBA) accreditation for the B. Tech program. Consequently, the School will be recognized by Washington Accord, which is an international agreement among bodies responsible for accrediting engineering degree programs. Thus, our B.Tech students will be benefited not only for pursuing higher degrees in other signatory countries but also met the academic requirements for entry to the practice of engineering.