

**BHASKARACHARYA COLLEGE
OF APPLIED SCIENCES (University of Delhi)**

“STAR COLLEGE SCHEME PROGRESS REPORT”

SUBMITTED TO DBT FOR SECOND COORDINATORS MEETING



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Bhaskaracharya College of Applied Sciences
University of Delhi

Star College Scheme: Progress Report (2012-2013)

**(for up gradation to Star College status/continuation of support at existing level
to colleges supported under Star College Scheme)**

1. Name of the College : **Bhaskaracharya College of Applied Sciences**
University of Delhi
Sector-2, Phase-I
Dwarka, New Delhi 110075

2. Year of Support : **December, 2010 onwards till date**

3. Total grant received during the period of support:

Non Recurring grant: Rs 20 lakhs
Total Recurring grant: Rs 16 lakhs approx.

4. Recognition by other funding agency :

- **UGC**
- **WHO (India Office)**
- **Department of Education (Delhi government),**
- **Ministry Of Health and Family Welfare(MHFW)**
- **Department of Science & Technology (DST)**
- **Ministry of Food Processing Industries (MOFPI)**

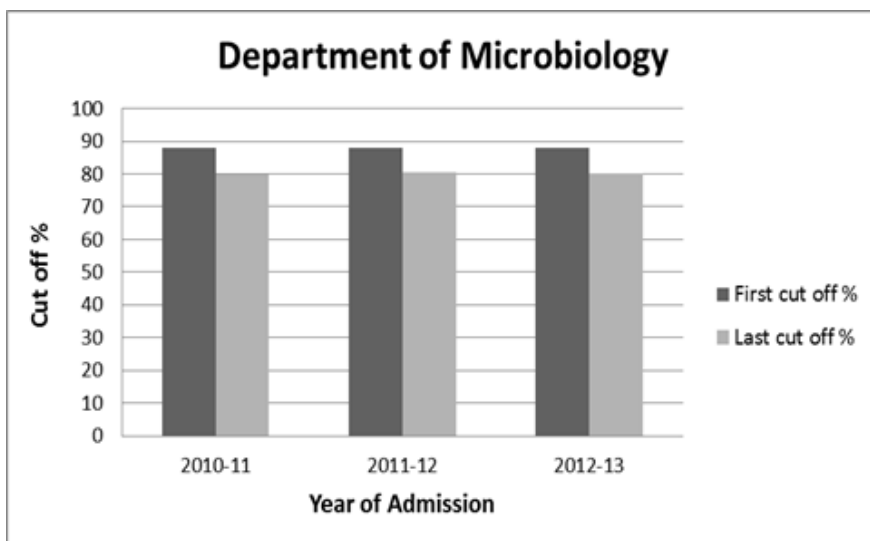
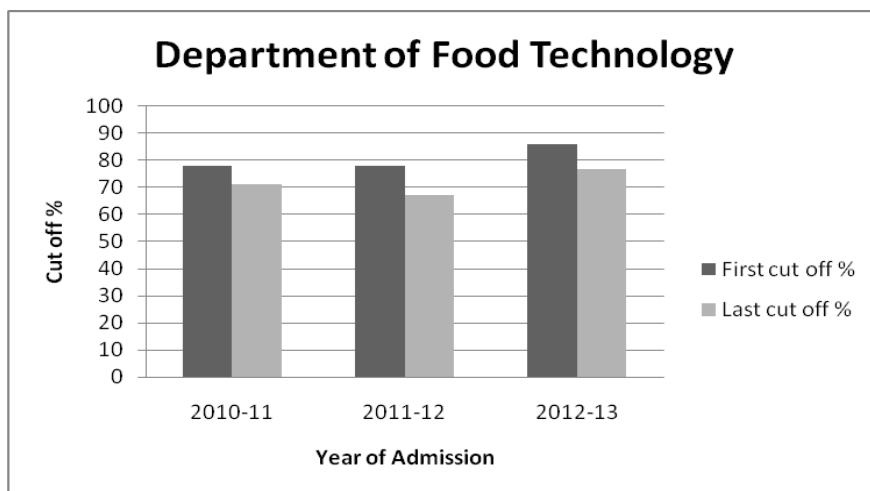
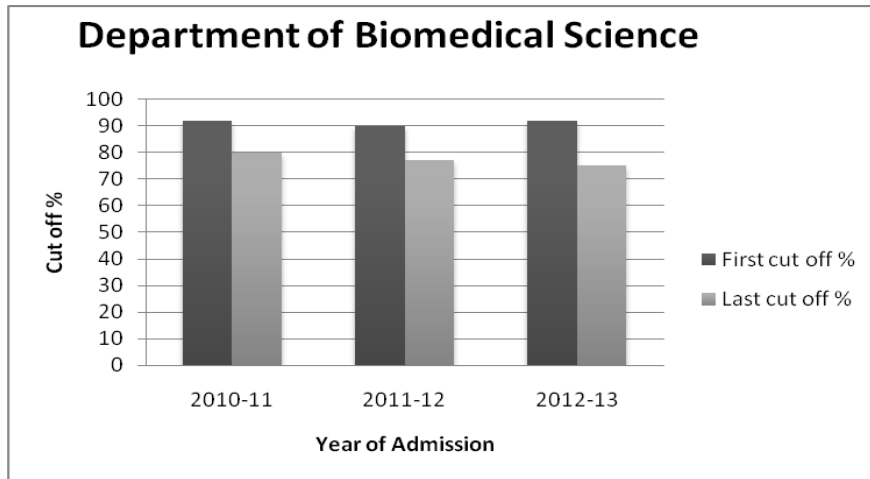
5. Name of Departments supported :

- **Biomedical Science**
- **Food Technology**
- **Microbiology**
- **Biochemistry (Allied Department-part of degree courses offered by all above three departments)**

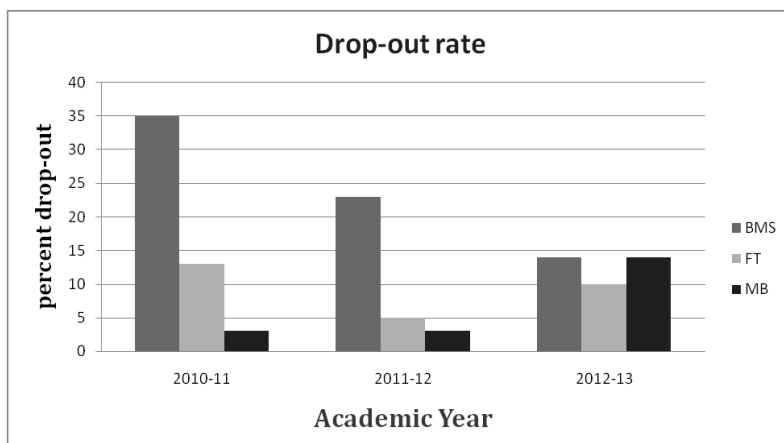
6. Department-wise Performance during the period:

Comparative analysis prior to support and after support in terms of:

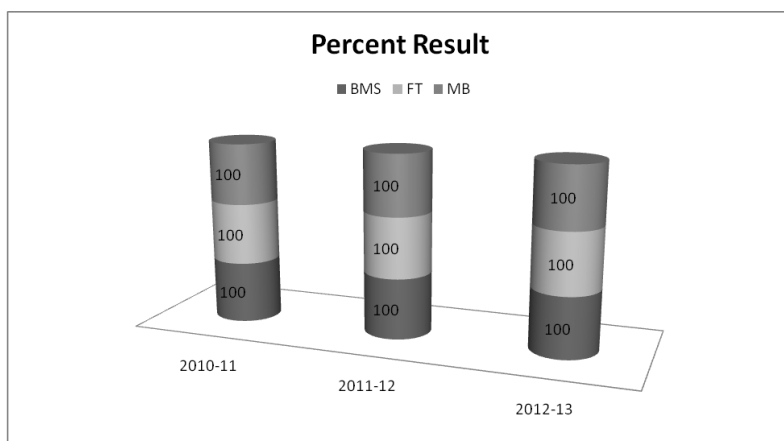
a. Cut off percent for admission



b. Drop-out rate



c. Percent result



d. Position in University

| University Positions of Bhaskaracharya College of Applied Sciences | | | | | | | | | |
|---|-----------------|----------|----------|------------------|----------|----------|-------------------|----------|----------|
| Name of the Department | 2009-2010 | | | 2010-2011 | | | 2011-2012 | | |
| | Student Name | Class | Position | Student Name | Class | Position | Student Name | Class | Position |
| Biomedical Science | Pallavee Khanna | II year | II | Attinder Chadhha | III year | III | Shubham Kesarwani | II year | I |
| | | | | Charu Aggarwal | I year | II | Charu Aggarwal | II year | II |
| Food Technology | Shilpi Bhandari | II year | I | Manisha Rawat | I year | I | Manisha Rawat | II year | I |
| | Ananya Das | III year | III | Akshay Bhalla | I year | III | | | |
| Microbiology | | | | Neha Singhal | II year | I | Neha Singhal | III year | II |
| | | | | | | | Shamsheeda Saifi | III year | II |

e. Student enrollment for higher studies

95% of our students generally go for further studies. Students are selected in the following higher Institutes or Research Organizations

| Biomedical Science | Food Technology | Microbiology |
|--|---|--|
| <ul style="list-style-type: none"> • Jawaharlal Nehru University • Banaras Hindu University • Dr. B. R. Ambedkar Center for Biomedical Research • South Campus, University of Delhi (UDSC) • Jamia Milia Islamia • Jamia Hamdard University • Indian Council of Agricultural Research • Hyderabad University • Indian Institute of Science • The Energy Research Institute • Indraprastha University • Poona University • Madurai Kamaraj University • National Centre for Biological Sciences | <ul style="list-style-type: none"> • Central Food Technology and Research Institute (Mysore) • G.B.Pant University (PantNagar) • Guru Nanak Dev University (Amritsar) • A.N.G.R.A U (Andhra Pradesh) • H.A.U • PAU • Guru Jambeshwar University • N.D.R.I Haryana. • Pondicherry University • Institute of Food Packaging | <ul style="list-style-type: none"> • University of Delhi • Jamia Millia Islamia • Indian Institute of Science • Banaras Hindu University • TERI University • Kurukshetra University • Kumaon University • Jaipur National University • Sardar Bhagwan Singh PGI of Biomedical Sciences & Research • Jayoti Vidyapeeth Women’s University Jaipur • LNJN National Institute of Criminology & Forensic Science, IP University • Pondicherry University • Goa University • VIT Vellore • University of Himachal Pradesh |

f. Performance in various competitive exams:

Food Technology students successfully competed in the above mention institutes examination and ICAR –JRF seeking admissions. In the current year, out of a batch of 32 students, 30 have opted for higher studies.

Biomedical Science students have been selected every year in the above mentioned Institutes. This year our University topper, Shubham Kerarwani also topped the combined M. Sc. – Ph. D. examination of Dr. B. R. Ambedkar Center for Biomedical Research, University of Delhi.

The students of **Department of Microbiology** are competing successfully for higher studies in various institutes mentioned above. Mr.Prateek and Mr. Aashish Jain have joined IIT,Mumbai and IIT,Roorkee respectively.

7. Number of workshops held for teachers and students:

Workshops conducted for the Students

| Department of Biomedical Science | | | | |
|----------------------------------|---|--|---|---|
| S. No | Name of the Workshop/Conference/Seminars | Date / Duration | Name of the Organisers/ Resource Persons | Number of participants |
| 1 | Medical Laboratory Techniques | 5 th and 6 th January, 2011 | Biopack India Ltd | 36 |
| 2 | Basic Techniques of Molecular Biology & Use of microscopic techniques in Biomedical Science | 12 th to 16 th Dec, 2011 | Dr. Gayatri Prakash, Daulat Ram College | 40 |
| 3 | A Hitchhiker's Guide to Cheminformatics and Drug Discovery | 14 th December, 2011 | Dr. Jan Wildenhain University of Edinburgh, United Kingdom | 60 |
| 4 | Applications of Fluorescence Spectroscopy in Biomedical Science | 15 th December, 2011 | Dr. Madhu Chopra, ACBR, DU | 60 |
| 5 | Techniques of animal handling such as Tubectomy, Hysterectomy and Orchidectomy on laboratory animals such as Wistar rats. | 20 th December, 2011 | Dr. B. R. Ambedkar Center for Biomedical Research, DU | 30 |
| 6 | Gene Expression Analysis | 11 th to 12 th September, 2012 | Dr. Tripti Bhatnagar, Codon Biotech | 30 |
| 7 | Human Papillomavirus in the causation of Human Cancer | 19 th February, 2013 | Prof. B. C. Das | 90 |
| 8 | Vitamin B12 deficiency: A silent epidemic | 19 th February, 2013 | Dr. Shantanu Sen Gupta | 90 |
| Department of Food Technology | | | | |
| S. No | Name of the Workshop/Conference/Seminars | Date / Duration | Name of the Organizers/ Resource Persons | Number of participants |
| 1 | First "Better Process Control School for Manufacturers of Low Acid Canned and Acidified Foods" in collaboration with US Food and Drug Administration, India Office | 1 st to 5 th March, 2011 | Dr. Shalini Sehgal Dr. Rizwana Mr. Tushar Kanti Dutta | 37 food industry professionals 15 students |
| 2 | Career in Food Safety – An international perspective | 17 th August, 2011 | Dr. Hirotooshi Tamura, Professor of Food Chemistry, Kagawa University | 20 students |
| 3 | Advances in Microbiological Analysis | 23 rd January, 2012 | Mr. Jules Jalenques, International Sales, Interscience, France in the college | 30 final year students |
| 4 | Winter School -Training on comprehensive understanding about food quality & safety testing Subjects Covered During Training : 1. Nutritional: Nutritional analysis of Food. 2. Microbiology: Microbiological testing and safety precautions during handling of the samples. 3. Heavy Metals: Techniques for analyzing the metals by Atomic absorption spectrophotometer. 4. Pesticides: Pesticides residue analysis by Gas chromatography mass spectrophotometry. 5. Antibiotics: Antibiotics analysis by Liquid chromatography mass spectrophotometry. 6. Toxins: Analysis of Mycotoxins by HPLC and ELISA. 7. Water: Analysis of water and waste water. | 10 th December, 2012 to 2 nd January, 2013 | Intertek, India located at Gurgoan | 17 students |

| Department of Microbiology | | | | |
|----------------------------|--|--------------------------------|---|------------------------|
| S. No | Name of the Workshop/Conference/Seminars | Date / Duration | Name of the Organisers/Speakers | Number of participants |
| 1 | Bacteriophages of Lactic Acid Bacteria, Foe and Friend in Food Production. | 21 st March 2011 | Professor Kunt Heller of Max Rubner Institute, Kiet, Germany | 120 |
| 2 | Emerging water-borne pathogens – The Indian Experience with <i>Yersinia enterocolitica</i> . | 17 th Feb 2012 | Professor J.S. Viridi, Head, Department of Microbiology | 110 |
| 3 | Functional foods for improved human health. | 17 th Feb 2012 | Dr. A.K. Puniya, Principal Scientist, National Dairy Research Institute, Karnal | 110 |
| 4 | Biocatalysis: A promising tool for environmentally benign industrial growth. | 5 th September 2012 | Prof. R. K. Saxena Department of Microbiology, University of Delhi South Campus | 100 |
| 5 | Microbiology- an exciting career ahead” | 2 nd Feb 2013 | Prof. J.S.Virdi Department of Microbiology, University of Delhi South Campus | 115 |
| 6 | From plant pathogen Interaction to GE crops: How science is converted to technologies. | 25 th March 2013 | Prof. Deepak Pental, former Vice-Chancellor, University of Delhi | 90 |

DEPARTMENT OF FOOD TECHNOLOGY : IN-HOUSE PROJECTS

Final year students were divided into a team consisting of two or three members each and worked at developing new products – their conceptualization, standardization, development at lab scale, packaging (designing of labels) and shelf life studies and their proximate analysis and finally report submission.

I. LIST OF NEW PRODUCTS DEVELOPED

Beet Root Concentrate, Beet Root Rolls, Hibtam Jam, Chikoo Crunch, Tahinah, Chestnut Delight, Sweet Potato Spread, Instant Flax Seed Chutney

- *We plan to file their patents too*

II. SURVEY TO STUDY THE STATUS OF FUNCTIONAL FOODS, KNOWLEDGE ABOUT FOOD LAWS AND PROBIOTICS AMONG THE COLLEGE GOING YOUTH

| | | |
|---|--|--|
| Dashmeet Kaur, Annu Bhatia, Priyanka Sharma, Garima Barniwal Jayati Bhatnagar Aman Dua | B. Sc. (Hons) Food Technology Third Year | Survey to study the Status of Functional Foods, knowledge about food laws and probiotics among the college goers |
|---|--|--|

Department of Biomedical Science : IN-HOUSE PROJECTS

| S. No. | Name of the Student | Name of the Departmental Mentor | Duration | Project Title |
|--------|---------------------|---------------------------------|---|--|
| 1 | Ambreen Khan | Dr. Shivani G. Varmani | 1 st June, 2012 to 21 st July, 2012 | Nutritional aspects of adults |
| 2 | Sumati Bangia | Dr. Uma Dhawan | 1 st June, 2012 to 21 st July, 2012 | Microarray analysis |
| 3 | Aditi Arya | Dr. Uma Dhawan | 1 st June, 2012 to 30 th June, 2012 | Microarray analysis |
| 4 | Ankita Katoch | Dr. Uma Chaudhry | 1 st June, 2012 to 30 th June, 2012 | Analysis of beta-lactamase producing plasmids of <i>Neisseria gonorrhoea</i> |
| 5 | Upasana Bajaj | Dr. Uma Chaudhry | 1 st June, 2012 to 30 th June, 2012 | DNA Microbial analysis |

Department of Microbiology : IN-HOUSE PROJECTS

Students of second and third year were encouraged to submit their research ideas under the guidance of departmental faculty. Two in-house projects have been started.

| S. No. | Name | Class | Project Title |
|--------|----------------------------|-----------------------------------|---|
| 1 | Mr. Surender Mr. Irshad | B.Sc.(Microbiology) IIIrd year | Incidence of coliforms and pathogenic bacteria on the currency notes in NCT |
| 2. | Mr. Anay Mr. Amit | B.Sc.(Microbiology) IIInd year | Role of <i>Trichoderma</i> as biocontrol agent |

ALL THE INDUSTRIAL/ INSTITUTIONAL PROJECTS HAVE BEEN MENTIONED AS ANNEXURE 2 FOR THE THREE DEPARTMENTS AND INDIVIDUAL ACTIVITIES OF FACULTY MEMBERS AS ANNEXURE I.

SEMINARS AND CONFERENCES ATTENDED BY THE STUDENTS

- Students of B.Sc (Hons) Biomedical Sciences Part III attended a Seminar entitled ‘Prospects of Diagnostics, Therapeutic Proteins & Human Vaccine Industry’ in PHD chamber of commerce and industry, PHD House, 4/2 Siri Institutional Area on 11th July 2011
- B. Sc. (Hons) Biomedical Science (BMS) III year Students attended a Conference of PHD Chamber entitled “Pharma Tech India 2012 : Towards cutting edge Technology” held on 14th September, 2012 held at Taj Mahal Hotel, Man Singh Road, New Delhi. The Conference was designed to deliberate and showcase the strategic role of Technology for Pharmaceutical Industry
- Students of Microbiology, Biomedical Science and Food Technology attended the Academic Congress 6th-7th September, 2012, University of Delhi
- Students of the participating Departments attended the National Conference on Redefining Science Teaching: Future of Education organized by Acharaya Narendra Dev College on 7th-9th March, 2013.
- Selected Girl students also attended US-India Workshop on Best practices for Women in Science on 10th December, 2012.

- Students were encouraged to attend various seminars and conferences to understand the growing needs of Indian Food industry. Students attended the following-
- 4th International Summit cum Exhibition on "Food Processing, Agribusiness and Cold Chain" on November 5th, 2012 at New Delhi.
- National Conference on Ushering Second Green Revolution in Indian Agriculture through public-private Partnership organized by CII held at Vigyan Bhavan on 11th December, 2012.
- International Conference on Innovations in Food Processing, Value Chain Management and Food Safety held at NIFTEM, Kundli, Sonapat on 10th- 11th January, 2013.

PUBLISHED RESEARCH ACTIVITIES

- **Paper presentation** in the International Conference and Exhibition on Food Processing & Technology held at Hyderabad from 22nd to 24th November 2012
 - (1) **“Evaluation of food safety practices in the retail outlets of West Delhi (India)”** by Shalini Sehgal, R.K. Khandal, Uma Chaudhry and Purnima Anand. J Food Process Technology/S1: 2157-7110-S1.007-6/Special Issue 2012
 - (2) **Rapid detection and characterization of pathogens present on fresh produce: A paradigm shift from culture plate to molecular biology.** By Uma Chaudhry, R. K. Khandal, Shalini Sehgal and Purnima Anand. J Food Process Technology/S1: 2157-7110-S1.007-001/Special Issue 2012
- **Poster presentation** in the National conference for “Redefining Science Teaching: Future of Education” organized by Acharya NarendraDev College, Delhi University on 9th March 2013 : **“Microbial Hazards Associated With the Vegetables Sold in Retail Market”** Shalini Sehgal, Purnima Anand and Manjusha N.

2012-2013 EDUCATIONAL VISITS

- Students of B.Sc. (H) Microbiology IIIrd year visited Technology Based Incubator and Department of Microbiology, South Campus, University of Delhi.
- B.Sc. (H) Food Technology semester II and IV students visited Parle Biscuit Factory located at Bahadurgarh, Haryana to gain industrial insight into baking technology.
- A trip to the Yakult Plant located at Sonapat was also organized for better understanding of fermentation technology for the students of all the three participating departments.

8. List of New Practicals Introduced and supported by the Star College Scheme-

Department Of Biomedical Science

1. Electro-blotting of proteins from SDS-PAGE gel onto PVDF membrane
2. Physiological data acquisition based experiments. (EEG, ECG, LFT, EMG, PET etc.)
3. Demonstration of - Barr Body
4. Metaphase chromosome preparation from peripheral human blood
5. Detection of single nucleotide polymorphisms (SNPs) using SNP specific primers and PCR.

6. Karyotyping with the help of photographs.
7. Study of abnormal karyotypes.
8. Demonstration of Confocal and electron microscopy in pathological experiments
9. Statistical calculation for LD 50 in the given data
10. Study of normal and abnormal ECG
11. Study of normal and abnormal Ultrasound scans
12. Study of normal and abnormal CT scans
13. Study of normal and abnormal MRI scans
14. Normal and abnormal X-ray films
15. To read the sequence of DNA from the given autoradiogram (manual sequencing)
16. Interpretation of sequence data obtained by automated sequencing.
17. Competent cell preparation and Transformation

Department of Food Technology

NEW PRODUCT DEVELOPMENT PRACTICALS – Includes the conceptualization, standardization, development of different products at lab scale, their packaging (designing of labels) and shelf life studies and also their proximate analysis .

9. Interdepartmental activities conducted:

- A workshop was organized on “**Role of probiotics in health and disease**” on 13th February 2013 by Dr. Neerja Hajela, Head Science, Yakult – Danone India
- The students of the department along with the students of Food Technology and Microbiology departments visited **Yakult, Sonipat** on 18th February 2013.
- **WORKSHOPS CONDUCTED**

| Interdepartmental Workshops | | | | |
|------------------------------------|--|--|---|-------------------------------|
| S. No | Name of the Workshops and silent features | Date / Duration | Resource Persons | Number of participants |
| 1 | Basic Microbiological Techniques A and B Various basic microbiological techniques were taught to students which would help them to work independently and in an interdisciplinary manner towards the accomplishment of the project. They were given in depth knowledge of principle and working of various instruments and sterilization techniques to be used in the project. The students gained hands on experience for preparation of media and bacterial culture techniques | A : 14 th and 15 th June, 2012 B: 27 th and 28 th June 2012 | Dr. Shalini Sehgal and Dr. Purnima Anand | 15 |
| 2 | Sampling and enumeration of micro-organisms In this workshop students were taught sampling techniques and quantitative methods | 25 th July, 2012 and 8 th August, 2012 | Dr. Shalini Sehgal | 15 |

| | | | | |
|---|--|-----------------------------|--|----|
| | of enumeration of micro-organisms with special emphasis on standard plate count, serial dilution and plating techniques. | | | |
| 3 | Hands on Training on “Polymerase Chain Reaction Students were given hands on training to set up a PCR reaction using primers already designed by the faculty members, in order to amplify products from known food pathogens. | 28 th June, 2012 | Dr. Uma Chaudhry | 25 |
| 4 | Use of Biostatistical Tools in Biological Research Students were given training on various data collection tools, types of data, They were also introduced to various type of studies and to the commonly used statistical software, Agreement analysis, Sample size determination. Hands on training on all topics in various Statistical Softwares (SPSS, Epi-info, etc.) was also imparted. | 5 th July, 2013 | Dr. Vandana Sabarwal (Institute of Home Economics) | 84 |
| 5 | Seminar on “Changing Paradigm of Food Safety”. Following lectures were held- <ul style="list-style-type: none"> • Food Safety – An Indian Perspective • Cold Chain Management • Need of Food Safety in Fruits and Vegetable Industry- | 5 th July, 2013 | Dr. R. K. Khandal, Vice Chancellor, UP Tech. University, Lucknow Ms. P. Alli Rani, CEO, FHEL, Concor, India. Mr. Rakesh Mehra, HEAD, IQF OPERATIONS, SAFAL | 85 |

• **Various Innovation Projects were conducted :**

| Project No. | Project Title | Project Investigators |
|-------------|--|---|
| BCAS-101 | Study of Rise in Consumption of the Mobile phones/Electronic Gadgets in Delhi region and Material Analysis projecting potential Electronic waste and their impact on environment | Dr. Geeta Bhatt, Dr. Manoj Khanna, Dr. Balaram Pani |
| BCAS-102 | Studies to assess the quality of fruits and vegetables with respect to microbial load and the remedial measures for their control | Dr. Shalini Sehgal, Dr. Purnima Anand, Dr. Uma Chaudhry |
| BCAS-103 | Development of Cost-Effective Nutritious Multi Cereal Bar and It's Sustainable Packaging Using Nano-Biopolymer | Dr. Meenakshi Garg Dr. Susmita Dey Dr. Shivani G. Varmani |
| BCAS-104 | Development and study of alternate packaging materials from agro wastes and its application in food packaging | Dr. S. K. Shukla Dr. Anand Bharadvaja Dr. Rizwana |

| | | |
|----------|---|--|
| BCAS-105 | Determine the Speciation of some Selected Heavy Metals from E-wastes and their Impact on Ground Water | Dr. Ramesh Kataria, Dr. Manoj K. Tiwari, Dr. Parthasarthy Pal, |
|----------|---|--|

• **Project Activities of this year :**

| S. No. | Name | Department | Project Title |
|--------|------------------|-------------------------------|--|
| 1. | Babbal Reehal | Dept. of Microbiology | Survey of Current Food Safety Practices in a popular Retail Chain (R1) |
| 2. | Namya Rishi | Dept. of Microbiology | Survey of Current Food Safety Practices in a popular Retail Chain (R2) |
| 3. | Surbhi Sinha | Dept. of Microbiology | Enumeration of Microbial Load on Fresh Fruits and Vegetables using Conventional Microbiological Methods |
| 4. | Tejaswani Arya | Dept. of Biomedical Sciences | Assessment of Microbial load using Standard Plate Count techniques To study the hygienic conditions in Retail Outlets |
| 5. | Aakash Dudhmande | Dept. of Bio-medical Sciences | Microbiological Sampling Technique on Fresh Produce Food Safety Practices Survey in New Delhi Retail Outlets |

Other activities

- First international “Better Process Control School for Manufacturers of Low Acid Canned Foods” in collaboration with US Food and Drug Administration, India Office was held at Negumbo, Srilanka from 21st to 23rd November, 2011.
- Laboratory Safety Workshop titled Chemical Lab safety: Hazards and Disposal guidelines (as per ILLI initiative) was conducted in the college for the lab staff on 10th May, 2011.
- Entrepreneurship Awareness Camp in collaboration with Innovation & Entrepreneurship Development Centre (IEDC), Acharya Narendra Dev College (University of Delhi) from January 4 -6, 2012 sponsored by National Science & Technology Entrepreneurship Development Board (NSTEDB), Department of Science & Technology (Government of India)
- The Food Technology Departmental Society ‘Ambrosia’ organised its annual inter college festival, Ambrosia 2012 on 27th September. Dr. Anupa Sidhu, Director of Lady Irwin College, University of Delhi was the chief guest for the occasion. During the technical session a lecture on ‘Food Packaging’ was given by Mr. Suman Kumar. A number of events were conducted to give an opportunity to the students from different colleges to display their talent in the field of Food Science. The most interesting of all was ‘Taste of India’, an event in which participants presented their home made dishes representing different states of India. Besides, there were brain storming sessions like Food Quiz, Crossword puzzle, Essay writing, Painting and Photography events on ‘Safe Food’ and ‘Street Food’.
- The festival **MICROQUEST-2013** included various students' activities such as Art streak, Collage competition, Micro burst, Micro masti and Treasure hunt. A poster making competition on the *Importance of Microorganisms* was also organized in which many students participated.

- A poster making competition on the theme “Science – Then and Now” was also organized which saw a very active participation from students all the streams in the college on 17th February, 2013.
- A seminar was held on “Changing Paradigm of Food Safety” on 5th July, 2013 organised by DU Innovative Project BCAS -102.
- Exhibition of the training and educational material under the Food Safety Education Initiative on 5th July, 2013.

10. Resources generated:

I.GENERATION OF VIRTUAL LABS (FOR LIFE SCIENCES)

Breaking away from the traditional hierarchical method of teaching, towards a constructive approach, we have been able to develop few virtual labs under the Star College Scheme which would help students learn the techniques which are difficult to perform in the labs.

1. To conduct Ames test or Reverse mutation test for screening substances for mutagenicity
2. Perform Southern Blot Hybridization
3. Detection of microbial load in a given sample.

This new method of learning marks a paradigm shift in teaching as well, provisioning students to understand and develop a scientific acumen.

II. BIOLOGICAL REPOSITORY COLLECTION

We have taken a new initiative of making a biological repository collections of microorganisms routinely required for various undergraduate students. Biological Repository have been created and made available to other college teachers are *Escherichia coli* DH5 α , *Escherichia coli* BL21, *Bacillus*, *Pseudomonas*, *Shigella*, *Neisseria* etc.

III. HUMAN GENETICS LABORATORY MANUAL , FOOD MICROBIOLOGY MANUAL and **MOLECULAR BIOLOGY MANUAL** were printed and provided to students of III year and II year respectively (2012-13) for incorporating their observations.

IV.FOOD SAFETY EDUCATION INITIATIVE

A complete training kit comprising of 14 posters (seven in Hindi and seven in English), leaflets, booklets were designed to help food handlers understand that the basic techniques of hand washing, hygiene, temperature control, proper storage play an important role in maintaining the supply of safe food. This training kit was used at various outlets to train the workers at the outlets and also being sent to the corporate offices of Indian Retail Sector for wider circulation at National level under the Food Safety Education Initiative.

V. The Microbiology society published a **magazine 'LIFE UNDER LENS'** in which students contributed a variety of articles related to microbiology and science.

11. Collaborative activities with neighboring colleges:

1. Certificate Course in Bioinformatics & in-silico Drug Discovery was introduced as *an initiative taken jointly by our College and Acharya Narendra Dev College (ANDC), University of Delhi* wherein students from both the colleges were given Hands-on Training in Bioinformatics. Dr Uma Dhawan from our college and Dr Gagan Dhawan from ANDC are co-ordinating the course. The classes were run on Saturdays and Sundays and during the vacations in both the colleges.
2. Biological Repository Collection generated by the Department has been made available to other colleges. Various biological strains, plasmids, reconstituted solutions and even slides have been given freely to other colleges.
3. Antardhvani – A multi-cultural festival of University of Delhi for the first time introduced an Award for Good Practices in which Bhaskaracharya College of Applied Sciences participated and its initiatives like New Product Development, Food Safety Education Initiative , Knowledge Initiative and the Star College Scheme were showcased. The visitors highly appreciated the efforts put in by the team and the students. The new products were appreciated and people wanted to purchase them too.

12. Qualitative improvements due to DBT support :

1. The faculty has been able to involve students in undertaking in house small research projects.
2. Educational material in the form of training kits, poster , visual labs, culture collection
3. Virtual Labs have been generated to help students learn practical's that are difficult to perform at the undergraduate program.
4. Faculty has been benefitted by the Star College scheme, as they were able to present their work in various Conferences. The financial support in the form reimbursement of registration fees and travel assistance helped.

5. Economically weaker students have been helped by the grant to undertake industrial trainings as some industries charge for 4-8 week training . This training was compulsory under the earlier curriculum.

13. Strengths and weaknesses of participating departments-

Strengths

1. Excellent Infrastructure
2. Qualified Faculty and inclination for research as showcased by the Innovative Projects and other projects
3. Recognition of the college by various agencies.
4. Emphasis on co-curricular activities.
5. With introduction of Four Year degree program, we are the only college in the University of Delhi **OFFERING FIVE B. TECH. DEGREE COURSES.**

Weaknesses

1. No appointments in DU For last two years which has led to lack of permanent faculty in the departments.
 2. Space crunch due to the increase in the no. of allotted seats in all the three departments.
 3. Being a science college, the students are busy from morning to evening in their regular classes (timing are 9.15am-5.00 pm) leaving very little time to pursue other activities although a special slot for once a week has been allocated.
 4. No transfer of technology from college to Industry in spite of the fact that innovative new cost effective food products have been developed.
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ANNEXURE-I

TEACHER'S ACTIVITIES (2012-2013)

Department of Biomedical Science

Dr. Shivani G. Varmani

- Co-principal Investigator for the UGC sanctioned major research project entitled 'Effects of Religious Fasting on Weight Loss in Indian Overweight and Obese Adult'
- Principal Investigator for DU innovative project entitled "Development of Cost Effective Nutritious Multi Cereal Bar and its Sustainable Packaging Using Nano-Biopolymer" *and two national patents are filed by the Delhi University under this project.*

Various Research Publications of Dr Shivani G. Varmani:

- Soni A, Sadhu SD, Garg M, Garg A, Handa R, Varmani SG, and Kaur B. Preparation of Starch-PVA Blend Using Potato and its Mechanical Characterisation. *Jr. of Nanomedicine and Nanotechnology*, Dec.2012 vol.3: issue 9; pg 97.
- Chauhan H, Garg M, Varmani SG and Sadhu SD. To Study the Preparation and Nutritional Quality of Multi-Cereal Bar in the *Proceedings of the ICBPN 2012 International Conference* held in Kottayam, Kerala on 20-22, September 2012.
- Umair S, Garg M, Varmani SG and Sadhu SD. Development of Multi-Cereal Protein Bar with Jaggery in the *Proceedings of the ICBPN 2012 International Conference* held in Kottayam, Kerala on 20-22, September 2012.
- Soni A, Sadhu SD, Garg A, Handa R, Garg M and Varmani SG. *Preparation of a Packaging Material from a Biopolymer and Study of the Mechanical Properties of the Film* has been accepted for the International Conference by APA at Chandigarh on 21-22 Feb. 2013.
- Dutta, A Jain, S, Varmani, S G, Garg M and Sadhu, S D. Preparation of Low Cost Multi Cereal Nutritive Bar in *J Food Process Technol. Open Access*, Nov. 2012, vol. 3, p10.
- Negi, T, Garg M, Varmani, SG and Sadhu, S. Making of Papaya Papada in the *Proceedings of 1st International Conference on Innovations in Food Processing, Value Chain Management and Food Safety* at NIFTEM, Kundali, Sonapat, Haryana on 10-11 Jan.2013.
- Jain S, Dutta A, Varmani S G; Garg M, Sadhu SD. Low Cost Multi Cereal Nutritive Bar in the *Proceedings of the 1st International Conference on Innovations in Food Processing, Value Chain Management and Food Safety* at NIFTEM Kundali, Sonapat, Haryana on 10-11 Jan.2013.

Dr. Uma Dhawan

- Invited as an external expert for the comprehensive examination of a PhD student at The Energy Resource Institute (TERI), New Delhi on July 20, 2012.
- Resource person in workshop for college teachers on theory and practical course “Biochemistry and Environmental Chemistry” for B.Sc. (Hons.) Chemistry (CHHT-514 and CHHP-514) organised by the Department of Chemistry, University of Delhi, July 2-7, 2012.
- Coordinator for a new add-on course in **Bioinformatics and in-silico Drug Discovery** for undergraduate and post-graduate students jointly run by Acharya Narendra Dev College and Bhaskaracharya College of Applied Sciences

Dr. Uma Chaudhry

- Was invited to give her inputs on Brainstorming Session on R & D Output Indicators (Biotech and Pharma Industry) by PHD Chamber of Commerce and Industry on 30th May, 2012
- Attended a Conference on “Emerging Trends in Development of Drugs and Devices” organized by Department of Chemistry, University of Delhi and three National Science Academies of India on 21st to 23rd January, 2013
- Presented a paper entitled “Rapid detection and characterization of pathogens present on fresh produce : A paradigm shift from culture plate to molecular biology” in an International Conference and Exhibition on Food Processing and Technology organized by OMICS group International held on 22nd to 24th November, 2012 at Hyderabad International Convention Centre, Hyderabad.
- Attended 32nd Annual Convention of Indian Association for Cancer Research (IACR) on Emerging Trends in Cancer Research: Road to Prevention & Cure and an International Symposium on Infection & Cancer at Dr. B. R. Ambedkar Center for Biomedical research, University of Delhi held on 13th to 17th February, 2013
- Attended a conference hosted by Institute of Informatics & Communication (IIC), UDSC and National informatics Centre (NIC), Govt. of India entitled "In Pursuit of an Idea", a unique event where IIC and NIC together works on to develop innovative applications based on published data and real world problems, held on 24 May, 2013 at 3:00 pm in the S.P. Jain Auditorium, University of Delhi South Campus.

Department of Food Technology

Dr. Rizwana

- Delivered a lecture on *Preservation of Meat to Ensure Safety and Maintain Quality* in the 7th Short Term Training Program (STTP) on Quality Issues in Meat and Poultry Processing Sector on 2-4 April 2012 organised by NIFTEM and National Meat and Poultry Processing Board, New Delhi.

- Project Faculty of Innovation Project BCAS-104 on ‘Development and Study of Alternate Packaging Materials from Agro-wastes and its Application in Food Packaging’, University of Delhi.

Dr. Shalini Sehgal

- Received the Best Teacher Award (citation and cash award) for the year 2011-2012 conferred by Directorate of Higher Education presented by Mrs. Sheila Dikshit, Honorable Chief Minister of Delhi on 10th May, 2012.
- Paper presented at the International Conference and Exhibition on Food Technology and Processing titled *Evaluation of Food Safety Practices in the Retail Outlets of West Delhi (India)* at Hyderabad, 20-22 November, 2012.
- Attended International Conference on Food Safety Implementation in Delhi, at India Habitat Centre from 19-20th March, 2013 on a panel discussion in Technical Session 2, on the following topic: "Challenges on Food Safety-Traceability and Product Recall" on 20th March 2013.
- Principal Investigator of the DU Innovative Project BCAS-102 titled “Studies to Assess the Quality of Fruits and Vegetables with Respect to Microbial Load and the Remedial Measures for their Control”.
- Coordinator of the ongoing project “Star College Scheme for strengthening of life science and biotechnology education and training at undergraduate level” sanctioned by the Department of Biotechnology (DBT), Ministry of Science and Technology AND represented BCAS in the first meeting of Coordinators of Colleges supported under Star College Scheme at SGTB Khalsa College, University of Delhi, May, 2012.
- Coordinator of the Food Safety Education Initiative , designed a complete educational kit
- Coordinator of Better Process Control School in collaboration with USFDA and launched the website - <http://bpcs-bcas.in/>
- Shalini Sehgal, R.K. Khandal, Uma Chaudhry and Purnima Anand. ‘Evaluation of food safety practices in the retail outlets of West Delhi (India)’ J Food Process Technology/S1: 2157-7110-S1.007-6/Special Issue 2012
- Uma Chaudhry, R. K. Khandal, Shalini Sehgal and Purnima Anand. ‘Rapid detection and characterization of pathogens present on fresh produce: A paradigm shift from culture plate to molecular biology.’ J Food Process Technology/S1: 2157-7110-S1.007-001/Special Issue 2012
- Shalini Sehgal, Purnima Anand and Manjusha N. ‘Microbial Hazards Associated With the Vegetables Sold in Retail Market’: Poster presentation in the National conference for “Redefining Science Teaching: Future of Education” organized by Acharya Narendra Dev College, Delhi University on 9th March 2013

Dr. Eram S. Rao

- Book published by Dr Eram S. Rao :
Rao, Eram. S. (2013) *Food Quality Evaluation*. New Delhi: Variety Book Publishers and Distributers New Delhi.
- Presented a paper on *Human Resource and Skill Development of Food Processing Industry* in International Conference on Development of Backward Regions Through Agriculture & Food Processing: Preparing a Roadmap held at Institute of Professional Studies , University of Allahabad from December 27 - 28, 2012.
- Presented a talk on *Nutritional Requirements for the Mother and Child* in Teleconferencing for Doctors at IGNOU, New Delhi on Feb. 14, 2013.

Dr. Meenakshi Garg

- Principal investigator for the UGC sanctioned major research project entitled *Effects of Religious Fasting on Weight Loss in Indian Overweight and Obese Adult*.
- Principal investigator for DU innovative project entitled *Development of Cost Effective Nutritious Multi Cereal Bar and its Sustainable Packaging Using Nano-Biopolymer and two national patents are filed by the Delhi University under this project*.

Publications of Dr. Meenakshi Garg

- Soni A, Sadhu SD, Garg M, Garg A, Handa R, Varmani SG, and Kaur B. (Dec.2012). Preparation of Starch-PVA Blend Using Potato and its Mechanical Characterisation. *Jr. of Nanomedicine and Nanotechnology*, vol.3: issue 9; pg 97.
- Chauhan H, Garg M, Varmani SG and Sadhu SD. To Study the Preparation and Nutritional Quality of Multi-Cereal Bar in the *Proceedings of the ICBPN 2012 International Conference* held in Kottayam, Kerala on 20-22, September 2012.
- Umair S, Garg M, Varmani SG and Sadhu SD. Development of Multi-Cereal Protein Bar with Jaggery in the Proceedings of the *ICBPN 2012 International Conference* held in Kottayam, Kerala on 20-22, September 2012.
- Soni A, Sadhu SD, Garg A, Handa R, Garg M and Varmani SG. *Preparation of a Packaging Material from a Biopolymer and Study of the Mechanical Properties of the Film* has been accepted at the International Conference at Chandigarh by APA on 21-22 Feb. 2013.
- Dutta, A Jain, S, Varmani, S G, Garg M and Sadhu, S D. (Nov. 2012). Preparation of Low Cost Multi Cereal Nutritive Bar in *J Food Process Technol Open Access*, vol. 3, p10.

- Negi,T, Garg M, Varmani,SG and Sadhu,S. Making of Papaya Papada in the Proceedings of 1st International Conference on *Innovations in Food Processing, Value Chain Management and Food Safety* at NIFTEM, Kundli, Sonapat, Haryana on 10-11 Jan. 2013.
- Jain S, Dutta A, Varmani S G; Garg M, Sadhu SD. Low Cost Multi Cereal Nutritive Bar in the Proceedings of the 1st International Conference on *Innovations in Food Processing, Value Chain Management and Food Safety* at NIFTEM Kundli, Sonapat, Haryana on 10-11 Jan. 2013.

Department of Microbiology

Dr. Pawas Goswami

- Presented a paper titled ‘Genetically Modified Microorganisms: Trends and Awareness’ at 12th Indian Science Communication Congress with the theme of Risk Communication and Development, held at Indian National Science Academy, New Delhi from 18th December to 20th December 2012.

Dr. Purnima Anand

- Participated in the first meeting of Coordinators of Colleges supported under Star College Scheme at SGTB Khalsa College, University of Delhi, May, 2012.
- Participated in The Academic Congress titled ‘Enabling the Young: Redefining Education’ organized by the University of Delhi, September 2012.
- Jury member for second national level exhibition and project competition under INSPIRE scheme of DST, organized in October, 2012.
- Participated in One day International symposium on Lignocellulose Biotechnology Consortium on 12th December, 2012, University of Delhi, South Campus
- Principal Investigator of the DU Innovative Project BCAS-102 entitled “Studies to Assess the Quality of Fruits and Vegetables with Respect to Microbial Load and the Remedial Measures for their Control.

Research Publications of Dr. Purnima Anand

- Shalini Sehgal, R.K. Khandal, Uma Chaudhry and Purnima Anand. ‘Evaluation of food safety practices in the retail outlets of West Delhi (India)’ J Food Process Technology/S1: 2157-7110-S1.007-6/Special Issue 2012
- Uma Chaudhry, R. K. Khandal, Shalini Sehgal and Purnima Anand. ‘Rapid detection and characterization of pathogens present on fresh produce: A paradigm shift from culture plate to molecular biology.’ J Food Process Technology/S1: 2157-7110-S1.007-001/Special Issue 2012
- Shalini Sehgal, Purnima Anand and Manjusha N. ‘Microbial Hazards Associated With the Vegetables Sold in Retail Market’: Poster presentation in the National conference for “Redefining Science Teaching: Future of Education” organized by Acharya Narendra Dev College, Delhi University on 9th March 2013

Dr. Vijaya Kumar Nalla

- Attended 32nd Annual Convention of Indian Association for Cancer Research (IACR) on Emerging Trends in Cancer Research: Road to Prevention & Cure and an

International Symposium on Infection & Cancer at Dr. B. R. Ambedkar Center for Biomedical research, University of Delhi held on 13th to 17th February, 2013

- Participated in a Twin workshop on "Effective Grant writing skills and IPR " held at India Habitat Centre by Biotech Consortium India Ltd., on 4th July 2012.

Dr. Ruchi Gulati Marwah

Publications of Dr. Ruchi Gulati Marwah

- P Anand, RK Saxena and RG Marwah. A novel downstream process for 1,3-propanediol from glycerol-based fermentation. *Applied Microbiology and Biotechnology*, 2011, 90 (4) : 1267-1276 (IF 3.425).
- MO Fatope, GB Varma , NM Al-Azri, RG Marwah and RS Nair, Kaurane Diterpenoids from *Blepharispernumhirtum*. *Chemistry and Biodiversity*, 2010, 7, 1862-1870. (IF 1.926).
- S.Srinivasan, S Gupta, R Marwah, P Manisankar, and R Kumar. Synthesis, characterization and in vitro biological studies of novel N-Aryl Piperazinyl Fluoroquinolones. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 2010, Vol. 1(3):727-738.

ANNEXURE- II (a)

LIST OF PROJECTS TAKEN BY B. Sc. (Hons) Biomedical Science II YEAR STUDENTS

| S. No. | Name of the Student | Name of the Institution | Duration | Project Title |
|--------|---------------------|---|---|---|
| 1 | Apoorva Uboveja | Maulana Azad Medical College | 1 st June, 2012 to 21 st July, 2012 | Protein extraction from <i>Tinospora</i> plant and determination of protein bands using SDS-PAGE |
| 2 | Akanksha | Maulana Azad Medical College | 1 st June, 2012 to 21 st July, 2012 | Protein extraction from <i>ocimum sanctum</i> plant and determination of protein bands using SDS-PAGE |
| 3 | Aanchal Gupta | Maulana Azad Medical College | 1 st June, 2012 to 21 st July, 2012 | P53 polymorphism in cancer. |
| 4 | Abhilekh | University of Delhi | 1 st June, 2012 to 21 st July, 2012 | Isolation of heavy metal (cadmium) resistant bacteria from <i>fly ash</i> and their characterization. |
| 5 | Charu Aggarwal | Miranda house (D. S. Kothari Centre for Research) | 1 st June, 2012 to 21 st July, 2012 | To clone and express mycobacterial proteins |
| 6 | Aradhaya Jain | Tata Memorial Centre, Mumbai | 1 st June, 2012 to 21 st July, 2012 | Screening of cervix pathology using different diagnostic modalities in Indian women. |
| 7 | Shivya Bhutani | All India Institute of Medical Lectures (AIIMS) | 1 st June, 2012 to 21 st July, 2012 | Karyotyping Studies |
| 8 | Monica | Chemistry Department, University of Delhi, North Campus | 1 st June, 2012 to 21 st July, 2012 | Medicinal Compounds Preparation |
| 9 | Yogesh Pandey | I.I.Sc, Bangalore | 1 st June, 2012 to 30 th June, 2012 | Mycobacterial Drug target analysis |
| 10 | Deep Prakash | I.I.Sc, Bangalore | 1 st June, 2012 to 30 th June, 2012 | Mycobacterial Drug target analysis |
| 11 | Shubham Kesarvani | I.I.Sc, Bangalore | 1 st June, 2012 to 30 th June, 2012 | Mycobacterial Drug target analysis |
| 12 | Somya Bhardwaj | All India Institute of Medical Lectures (AIIMS) | 1 st June, 2012 to 30 th June, 2012 | Naringin studies in neuronal models of rats |
| 13 | Kriti | All India Institute of Medical Lectures (AIIMS) | 1 st June, 2012 to 30 th June, 2012 | Clinical analysis of blood |
| 14 | Vandana | Genetics Department, University of Delhi, | 1 st June, 2012 to 30 th | Plant Genetics |

| | | | | |
|----|-------------------|---|---|--|
| | | South Campus | June, 2012 | |
| 15 | Ruchi Tiwari | Genetics Department, University of Delhi, South Campus | 1 st June, 2012 to 30 th June, 2012 | Plant Tissue Culture Techniques |
| 16 | Anjali Dixit | V. Patel Chest Institute, North Campus | 1 st June, 2012 to 30 th June, 2012 | Immunization studies |
| 17 | Ankit Kumar | V. Patel Chest Institute, North Campus | 1 st June, 2012 to 30 th June, 2012 | Investigated the effect of naltrexone and neurobehavioral changes due to acute and repeated restraint stress in wistar rats. |
| 18 | Nabeel Ali | V. Patel Chest Institute, North Campus | 1 st June, 2012 to 30 th June, 2012 | Effect of naltrexone and neurobehavioral changes |
| 19 | Kamta Dubey | North campus, du | 1 st June, 2012 to 30 th June, 2012 | Effect of alcohol (ethyl alcohol) on macrophages in-vitro studies. |
| 20 | Tenzin | North campus, du | 1 st June, 2012 to 30 th June, 2012 | Effect of alcohol (n-butanol) on macrophages in-vitro studies. |
| 21 | Namrata Gautam | Genetics Department, University of Delhi, South Campus | 1 st June, 2012 to 30 th June, 2012 | Human Genetics Analysis of fragile X syndrome |
| 22 | Namit Dey | Chemistry Department, University of Delhi, North campus | 1 st June, 2012 to 30 th June, 2012 | Use of iron oxide and gold nanoparticles in nanobiotechnology. |
| 23 | Sunil Gupta | University of Delhi | 1 st June, 2012 to 30 th June, 2012 | Isolation of heavy metal(nickel) resistant bacteria from <i>fly ash</i> and their characterization. |
| 24 | Jyotsana Dhama | IIT, Delhi | 1 st June, 2012 to 30 th June, 2012 | Protein Purification techniques |
| 25 | Savita Goswami | IIT, Delhi | 1 st June, 2012 to 30 th June, 2012 | Protein Purification techniques |
| 26 | Siddharth Gussain | Dr. B. R. Ambedkar Center for Biomedical Research | 1 st June, 2012 to 30 th June, 2012 | <i>De novo</i> identification of protein complexes that bound to pre-pik3c2b |

ANNEXURE- II (b)

LIST OF PROJECTS TAKEN BY B. Sc. (Hons) FOOD TECHNOLOGY STUDENTS

Department of Food Technology

Industrial projects (2012-13) The second year students go to the industry for familiarization with Food Industry for 4 weeks whereas third year student undertake a project (4-6 weeks) as listed below

Second year Students-

| Name of the industry | Students |
|-----------------------------|---|
| Safal | Aman, Karan, Jasveer, Deepak |
| Haldirams | Anita, Priya, Silvi |
| Mother Dairy | Manisha, Megha |
| PepsiCo | Monika, Vandana |
| Britannia | Akshay, Dashmeet, Manar |
| DMS | Rohant, Jyoti, Shashi, Kshitij, Sapna, Manish |
| Nirulas | Shubhendu, Raj Kumar |
| Intertek | Priyanka, Anu, Sanjay, Rakesh |
| Wallmart | JayatiBhatnagar |
| Sky chef | SapnaVerma, Ritu, Swati |
| Calpro | Garima, Sumiti |

Third year students

| Name of Student | Name of the Industry | Project |
|------------------------|---|---|
| Vikas Malla | Parle Agro | Sanitation norms in Beverage Industry and its validation |
| Megha Negi | Safal | Frozen Foods |
| Alka Chahaun | Sky Gourmet Catering | Validation Of CCP |
| Vaishali Sharma | Golden Wheat and allied Mills Pvt. Ltd. | Developing Food safety Training Module |
| Prashant Kumar | Golden Wheat and allied Mills Pvt. Ltd. | Effect of dough mixing time on buns |
| Rajeev Kumar | Golden Wheat and allied Mills Pvt. Ltd. | Effect of dough mixing time on bread |
| Rahul Vashistha | Safal | Packaging of frozen peas |
| Ayush Kumar | Jumbo Ltd | Canning of peppers |
| Vikas Lakra | Delhi Milk scheme | To determine the weight of 500 ml pack at different time interval and determine one day |

| | | |
|-----------------------|---|---|
| | | loss |
| Prashant Kumar Gautam | Delhi Milk scheme | To determine the weight of 1L pack at different time interval and determine one day loss |
| Seema Bari | Intertek | Study of various technique used in commercial analysis of Honey |
| Chandni Parvanda | Britannia | Controlling weight variation in 50-50 biscuits |
| Ankita Batra | Bikanerwala foods Pvt Ltd | Quality analysis and processing of milk based canned product |
| Jyoti Bohra | Safal | Frozen Foods |
| Manjari Singh | Frontier Biscuits Factory Pvt Ltd | Biscuit formulation |
| Deepika Sharma | Frontier Biscuits Factory Pvt Ltd | Biscuit Analysis |
| Shikha | Frontier Biscuits Factory Pvt Ltd | Sensory evaluation of different khatais |
| Deepika Arora | Bikanerwala foods Pvt Ltd | standardization of finished Product |
| Anshu Mehra | Mother Dairy | Chemical and microanalysis of milk and milk products |
| Parvinder Singh | Delhi Milk scheme | To study difference in weight of milk during packing from different machines |
| Naveen Chillar | Sky Gourmet Catering Pvt Ltd | FSMS |
| Saloni Parashar | Nestle India Ltd | To reduce the losses caused due to non utilization of noodle cakes |
| Surbhi Negi | Mother Dairy | Milk Processing |
| Om Prakash | Golden Wheat and allied Mills Pvt. Ltd. | Proofing time effect,Raw material storage conditions and how to control product wastage in baking industry. |

ANNEXURE- II (c)

LIST OF PROJECTS TAKEN BY B. Sc. (Hons) MICROBIOLOGY STUDENTS

| S.No. | Name | Project/Summer Training Title | Duration | Place |
|-----------------------------|---|--|---|---|
| 1. 2. 3. 4. 5. | Mr. Surender Rawat Mr Irshad Mr.Gurdeep Rattu Mr Ajay Kumar Mr.Puneet Rathee | Sample testing in Pathology Lab | 5 th June ,2012 to 21 st July, 2012 | University College of Medical Sc. |
| 6. 7. 8. 9. 10. | Ms.Shefali Thakur Ms.SnehaChatterjee Ms.NehaDayal Ms.Vishakha Ms.Diksha Kaila | Quality Control | 28 th May, 2012 to 6 th July, 2012 | Delhi Milk Scheme |
| 11. 12. | Ms.Swati Gupta Ms.SonaliWadhwa | Quality assurance of milk and its products | 5 th May, 2012 to 28 th July, 2012 | Mother Dairy |
| 13 14 15 | Ms.Garima Ms.Divya Singh Mr.AkshatKinnoo | Microbiological analysis of packaged drinking water. | 1 st June, 2012 to 30 th June, 2012 | Bureau of Indian standard , central laboratory, Sahibabad |