# 2023-24

# DBT STAR REPORT

# ACHARYA NARENDRA DEV COLLEGE

University of Delhi

**Acharya Narendra Dev College**
DBT STAR STATUS
Progress Report

Assessment duration : **2023-2024** Duration in Years : 1 year

## Details of Departments' Supported

| S. No. | Name of Department | Courses (B.Sc./M.Sc./PG Diploma, Certificate etc) offered | Regular Faculty members | |
|---|---|---|---|---|
| | | | Total =49 | |
| | | | With Ph.D. | Without Ph.D. |
| 1 | Biomedical Science | B.Sc. (Hons) | 05 | Nil |
| 2 | Botany | B.Sc. (Hons), B.Sc. (Prog) Life Science | 06 | Nil |
| 3 | Chemistry | B.Sc. (Hons), B.Sc. (Prog) Life Science, B.Sc. (Prog) Physical Sciences, M.Sc. | 12 | Nil |
| 4 | Computer Science | B.Sc. (Hons), B.Sc. (Prog) Physical Sciences | 06 | Nil |
| 5 | Electronics | B.Sc. (Hons) | 05 | Nil |
| 6 | Physics | B.Sc. (Hons), B.Sc. (Prog) Physical Sciences | 10 | 01 |
| 7 | Zoology | B.Sc. (Hons), B.Sc (Prog) Life Science | 05 | 01 |

Co-ordinator
DBT STAR COLLEGE SCHEME
Acharya Narendra Dev College
(University of Delhi)

Officiating Principal
Acharya Narendra Dev College
(University of Delhi)
Govindpuri, Kalkaji
New Delhi-110019

## A. Qualitative improvements due to DBT support. Please highlight 5 salient points (within 500 words).

Acharya Narendra Dev College, a Constituent College of the University of Delhi with NAAC grade of $A^+$, ranked 19th Best Science College in India by the India Today survey based study this year besides garnering 21st position under the National Institutional Ranking Framework (NIRF) of Ministry of Education, Govt. of India. The College is STAR STATUS since 2021. The Mathematics Department has been selected for Strenghening component under DBT Star College Scheme. This year the college presented the work carried out under DBT STAR STATUS in the Task Force Meeting held at Coimbatore. The College secured $A^+$ grade. This year college also has been granted PRAYAAS PROJECT funded by NCERT. Department of Education in Science and Mathematics has for the very first time launched a scheme named PRAYAAS (Promotion of Research Attitude In Young and Aspiring students). Lovely Public Sr. Sec. School, P.D. Vihar was selected in collaboration with HEI partner ANDC.

1) **Development of Skill Centers, Virtual labs@ANDC and Value Addition Courses**: The grant facilitated the establishment of various skill centers like Sericulture Skill Development Center (SSDC), Mushroom Research and Skill Development Center (MRSDC) and Zebrafish *(Danio rerio*) culture laboratory. In addition, the college is pioneer in developing V-labs for UG students. These centers provided opportunities for national-level workshops enhancing skills for faculty, non-teaching staff, and undergraduate students. **(Appendix I)**

2) **Setting up of Advanced Instrumentation Facility**: The College has set up a Central Instrumentation Facility (CIF) equipped with advanced equipments like AAS, SPR, 3-D Printer, and PCR machine. These resources support interdisciplinary projects. **(Appendix II)**

3) **Research Support**: Financial assistance encouraged students and faculty to engage in research activities, including writing books, contributing to academic publications, and receiving awards. Their work is recognized in Scopus indexed journals and peer-reviewed international/national journals. **(Appendix III, VI and XIV)**

4) **Hosting International Conferences, Workshops and Outreach Programs**: The grant enabled ANDC to host international conferences, fostering academic interactions, knowledge sharing, and collaborative research initiatives. The college successfully organized online International Conference. Utilizing the STAR Grant, the College organized international workshops and outreach programs for school students, as well as training programs for postgraduate students. Many postgraduate students are conducting their M.Sc. dissertations under the mentorship of ANDC faculty. **(Appendix IV and XV )**

5) **Green Initatives**: The College with the help of grants received from DBT has initiated Vermicomposting and Hydroponics. Both hydroponics and vermicomposting offer sustainable alternatives to traditional agricultural practices, promoting resource efficiency, environmental conservation, and improved plant growth. Integrating these methods into farming and gardening practices can contribute to a more resilient and productive food system. **(Appendix V)**

Overall, the DBT STAR Grant significantly contributed to College's development in research, skill enhancement, and international academic collaborations.

## B. Any Novel aspect introduced or planning to introduce during the Scheme duration.

**Introduced**

i. Mentoring school students in their research
ii. Outreach Programs were conducted for school students
iii. Introduction of Skill enhancement courses like Hydroponics, Forensics

**Planning**

i. Mentoring of rural and other institutes to apply for DBT STAR Grant under its strengthening components

## C. Lessons learnt / difficulties faced/suggestions if any, in implementation of the programme and utilization of DBT grant. (Max 3 points within 300 words)

No issues

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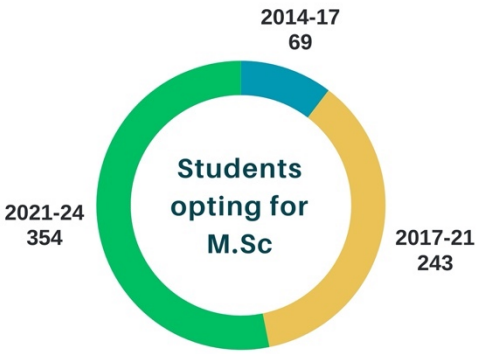
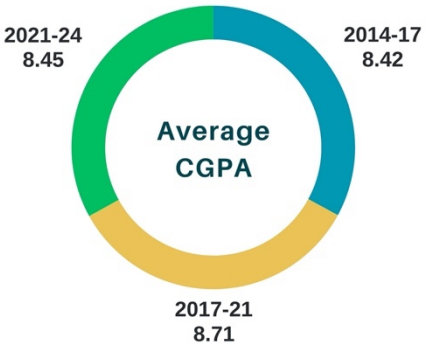
## Key Performance Indicators

| S. No. | Indicator | Pre-support (2014-2017) | During /After Support (2022-2023) |
|---|---|---|---|
| 1 | No. of students passing out (%) Students Admitted/passing out (pass %) | 100% | 100% |
| 2 | No. of students opting for M.Sc. | Biomedical Science: 09<br>Botany: 07<br>Chemistry: 21<br>Computer Science: 08<br>Electronics: 09<br>Physics: 07<br>Zoology: 08 | Biomedical Science: 15<br>Botany: 15<br>Chemistry: 12<br>Computer Science: 15<br>Electronics: 14<br>Physics: 18<br>Zoology: 15 |
| 3 | Average marks (CGPA) | Biomedical Science: 7-8<br>Botany: 7-8<br>Chemistry: 7-8<br>Computer Science: 8-9<br>Electronics: 8-9<br>Physics: 8-9<br>Zoology: 7-8 | Biomedical Science: 8-9<br>Botany: 8-9<br>Chemistry: 8-9<br>Computer Science: 8-9<br>Electronics: 7-8<br>Physics: 8-9<br>Zoology: 8-9 |
| 4 | No. of new experiments introduced (Appendix VIII) | NIL | Biomedical Science: 33<br>Botany: 19<br>Chemistry: 26<br>Computer Science: 44<br>Electronics: 37<br>Physics: 29<br>Zoology: 42 |
| 5 | Publications (scopus indexed) /patents, if any (Appendix IX) | Biomedical Science: 05<br>Botany: 04<br>Chemistry: 04<br>Computer Science: 04<br>Electronics: 02<br>Physics: 12<br>Zoology: 10 | Biomedical Science: 19<br>Botany: 08<br>Chemistry: 19<br>Computer Science: 07<br>Electronics: 06<br>Physics: 27<br>Zoology: 15 |
| 6 | Training received by faculty (Appendix X) | Biomedical Science: 08<br>Botany: 03<br>Chemistry: 03<br>Computer Science: 00<br>Electronics: 00<br>Physics: 04<br>Zoology:06 | Biomedical Science: 10<br>Botany: 04<br>Chemistry: 09<br>Computer Science: 01<br>Electronics: 07<br>Physics: 06<br>Zoology:12 |
| 7 | Exhibitions/seminars /training courses conducted (Appendix XI) | Biomedical Science: 04<br>Botany: 04<br>Chemistry: 03<br>Computer Science:04<br>Electronics: 03<br>Physics: 02 | Biomedical Science: 16<br>Botany: 05<br>Chemistry: 12<br>Computer Science: 03<br>Electronics: 03<br>Physics: 02 |

| | | | |
|---|---|---|---|
| | | Zoology: 04 | Zoology: 09 |
| 8 | Outreach activities (Popular lectures) (Appendix IV and XII) | Biomedical Science: 07<br>Botany: 06<br>Chemistry: 02<br>Computer Science:2<br>Electronics: 05<br>Physics: 02<br>Zoology: 06 | Biomedical Science: 18<br>Botany: 04<br>Chemistry: 06<br>Computer Science: 04<br>Electronics: 20<br>Physics: 02<br>Zoology: 20 |
| 9 | Colleges mentored to apply for DBT Star College grants | NA | NIL |
| 10 | Interdisciplinary Projects (Appendix VII) | Nil | 69 |
| 11 | Invited lectures (Appendix XIII) | 02 Lectures/Year/Department | Biomedical Science: 18<br>Botany: 13<br>Chemistry: 02<br>Computer Science: 06<br>Electronics: 01<br>Physics: 01<br>Zoology: 20 |



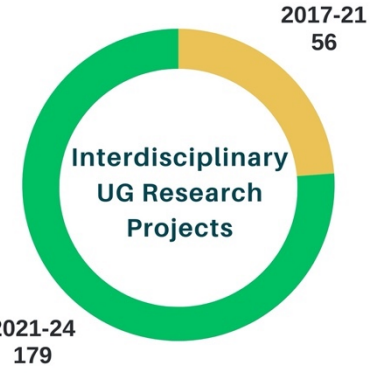



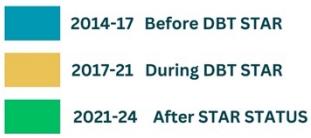

**Student Performance and interest toward Higher Studies**

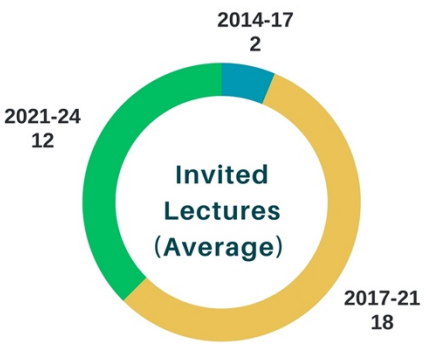


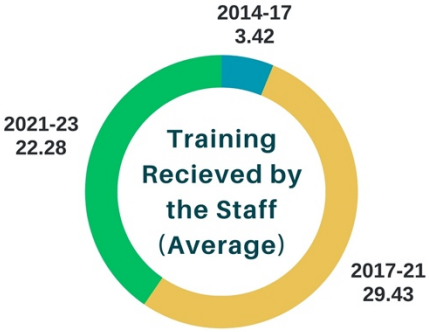
**Hands-on Exposure to newly introduced experiments**

**Exposure to Interdisciplinary Research for UG Students**

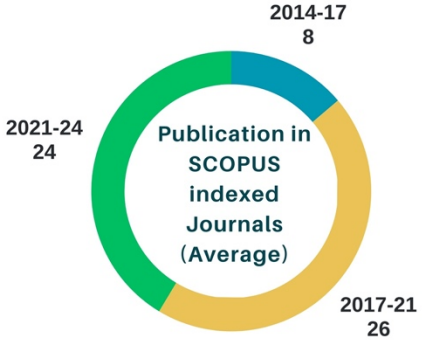


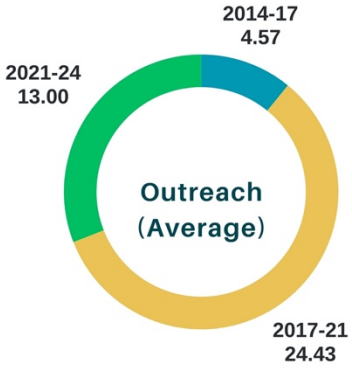






**Improving the knowledge base of students and staff**




**Academic Improvement of Teaching Staff**

# Appendix I

## Development of Skill Centers and Virtual labs@ANDC

Acharya Narendra Dev College's emphasis on the establishment of skill center programs signifies a proactive approach in imparting students with hands-on and relevant expertise. These centers have the potential to significantly enhance students' capabilities, preparing them for success in their selected domains and the professional realm. Moving forward, these skill centers will open avenues for students to engage in internships, cooperative programs, and industry projects, enabling them to acquire practical experience.

### A. Sericulture Skill development Centre

Co-ordinators: Prof. Seema Makhija, Mr Sanjay Vohra

Given the promising employment and entrepreneurship opportunities in the sericulture industry, Acharya Narendra Dev College has established a Sericulture Skill Development Centre in Sericulture. The primary goal is to provide students with comprehensive skills and knowledge in sericulture techniques. The center aims to offer extensive expertise in sericulture skills and methodologies, coupled with hands-on experience in breeding, rearing, harvesting cocoons, and post-cocoon processing. This year College organized a 7 Day Faculty Development Program on *Sericulture: Rearing and its Applications* for the faculty of University of Delhi in which hands on experience was given on rearing methods for mulberry silkworm.

### B. Mushroom Research and Skill Development Centre (MRSDC)

Coordinators: Dr Anupama Shukla, Dr Anita Narang and Dr Vineet Kumar Singh

The Mushroom Research and Skill Development Center (MRSDC) at Acharya Narendra Dev College operating under the DBT-STAR status scheme. Its primary objective is to offer a mushroom culture facility to students enrolled in the SEC course focused on Mushroom Cultivation Technologies. Apart from imparting skills related to cultivating diverse mushroom varieties, MRSDC has expanded its role to encompass a wide array of activities. These include engaging in research, ensuring high-quality spawn production, conducting outreach programs, delivering training sessions, and extending its services to dispel prevalent myths surrounding mushroom cultivation and consumption. Mushroom technology is hailed as an environmentally friendly approach with the potential to address various societal and environmental challenges, such as air pollution, malnutrition, unemployment, and promoting women empowerment.

### C. Zebrafish (*Danio rerio*) Culture Lab

Convenor: Dr. Monica Misra; Co-Convener: Ms. Bhumika Chauhan

मत्स्य *Lab* - Zebrafish Culture facility, established at Acharya Narendra Dev College through the support of the DBT Star Scheme, aims to inspire and engage budding scientists in research pursuits.. It provides a hands-on experience in laboratory practices, delving into the captivating realm of live animal research and nurturing a more empathetic approach towards our environment and its creatures. Notably, we stand as the second college within the University of Delhi to initiate the development of a Zebrafish lab. The College is in the process of Registration of Internal Animal Ethical Committee (IAEC). Once approved by the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), Govt. of India, the breeding of fishes and study of various life stages and behavioural patterns will be done to establish patterns in the fish and its resemblance to humans.

MUSHROOM RESEARCH AND SKILL DEVELOPMENT CENTRE


SERICULTURE RESEARCH SKILL DEVELOPMENT CENTRE

## D. Virtual lab at ANDC (V-Lab@ANDC)

Coordinator: Prof. Seema Makhija (Zoology) and Dr Vineet Singh (Botany)

Conveners: Dr Sanjeeta Rani (Physics), Prof. Sharanjit Kaur (Computer Science), Dr Anita Narang (Botany), Dr Neeti Mishra (Chemistry)

Acharya Narendra Dev College pioneered the concept of a Virtual Lab (V-Lab), aiming to grant undergraduate science students remote access to various labs via the internet. This initiative marked the college as the trailblazer in implementing V-Lab within the University of Delhi. The course design for various labs and experiments available on V-Lab@ANDC is forward-thinking, adopting a four-quadrant model for e-content, aligned with the principles of the National Education Policy (NEP)-2020. The V-Lab@ANDC website is curated and managed by students themselves, covering four domains: Biological Science, Chemical Science, Electronics, and Physical Science, encompassing seven departments: Biomedical Science, Botany, Chemistry, Computer Science, Electronics, Physics, and Zoology.

***Bootcamps for V-Lab Development. This year two Bootcamps were organized:***

One-week Bootcamp 2.1 for V-lab Development (March 11 – 15, 2024)

Five day Bootcamp on 'V-Lab Development 2.2 and Bootcamp on 'V-Lab Development (Building Blocks of Simulator)' (April 24-28, 2023)

Conveners: Prof Seema Makhija, Prof Sharanjit Kaur, Dr Pooja Bhagat. and Dr Vineet K Singh

### Names of students involved in Virtual Lab

| S.No. | Name | Course | Project | Mentors | Link |
|---|---|---|---|---|---|
| **1.** | Ayush Chaudhary, Pranjal Verma and Ravi Tomer | B.Sc.(P) Computer Science | Merge sort using recursion | Prof. Sharanjit Kaur, Ms. Nishu Singh, Ms. Gunjan Rani | https://vlab-nu.vercel.app/ |
| **2** | Ayush Bhardwaj<br><br>Arpit Bhardwaj | B.Sc. (H) Computer Science | Depth First Search | Prof. Sharanjit Kaur, Ms. Gunjan Rani | |
| **3.** | Ayush Bhardwaj<br><br>Arpit Bhardwaj | B.Sc. (H) Computer Science | Breadth First Search | Prof. Sharanjit Kaur, Ms. Gunjan Rani | |
| **4.** | Avishkaar Pawar | B.Sc.(H) Computer Science | Hamming Code | Prof. Sharanjit Kaur | https://hamming-code.vercel.app/ |
| **5.** | S. Kanak Megha | B.Sc.(H) Computer Science | Priority scheduling | Prof. Sharanjit Kaur | |
| **6.** | Mayank Kumar<br><br>Nishant Pratap Singh | B.Sc.(H) Computer Science | Search Algorithms | Prof. Sharanjit Kaur | https://66258ee4ba35a70c712e44b1--inspiring-rolypoly-3709e1.netlify.app/ |

| | | | | | |
|---|---|---|---|---|---|
| **7** | Sheelam Saroj | B.Sc.(H) Zoology | Mitosis using acetocarmine staining technique | Prof. Ravi Toteja Prof. Seema Makhija | https://www.vlab.andcollege.du.ac.in/bioSc/zoology/mitosis/mitosis.html |

## Tutorial Lectures recorded by Faculty

CEC Gurukul Lectures Recorded by Prof. Charu Gupta, Department of Botany

1. Anther- Part I https://youtu.be/vM4VJ2Ay1Ts?si=EXd3mYwz9tuZxQ77 December 27, 2023
2. Anther- Part II https://youtu.be/3C-sT-zBAF4?si=x3hZ4v6CVg6FZYAC December 27, 2023
3. Pollen Development – 1 https://www.youtube.com/watch?v=EJNDPwSaK0s January 29, 2024
4. Pollen Development – 2 https://www.youtube.com/watch?v=MvXc34LBfRg January 29, 2024
5. Pollen Development - III https://youtu.be/b7EhIygvdYk?si=gHyQLQHt6BQh7k1u February 27, 2024
6. Pollen Development -IVhttps://youtu.be/JYVxN06AV9M?si=zxhn9SA7g_nvY6sBFebruary 27, 2024
7. The Angiosperm Ovule 1-https://youtu.be/_yObK_dVY8c?si=xBketCRQGFitHQil March 20, 2024
8. The Angiosperm Ovule 2https://youtu.be/tO6BkiknOXY?si=f6hTsbym_VSx3PvH March 20, 2024
9. Components of Embryo Sacs in Angiospermshttps://youtu.be/RnhUAdE9oV8?si=Bhw2VaZeTze1WVy7April 29, 2024.
10. Different types of Embryo Sac Development in angiosperm https://youtu.be/7w2rj3L_Ri8?si=KHuT8aXi5civ55LbApril 29, 2024




VIRTUAL LAB AT ANDC


ZEBRA FISH CULTURE LABORATORY

## Value Addition Courses by Acharya Narendra Dev Kaushal Kendra

| S.No. | Name of the Course/ Workshop | Period | Hours | No of Students attended the Course/Workshop |
|---|---|---|---|---|
| **1** | Basics of Research Methodology for Physical Science and Life Science students | January 05, 2023-June17, 2023 | 40 | 18 |
| **2** | Practical Training in Research Methodologies for college students | October 28, 2023-April 27, 2024 | 40 | 08 |
| **3** | e-workshop on 'Learning the Basics of ChemDraw Software' | February 18, 2024 | 04 | 06 |
| **4** | 'Exploring the Fundamentals of Scifinder' | March 14, 2024 | 03 | 11 |
| **5** | Tools and Techniques in Biological Sciences | January, 2024-March, 2024 | 30 | 32 |

### 1) Basics of Research Methodology

The college conducted a certificate courses namely 'Basics of Research Methodology' for Physical Science and Life Science students of the college. The course was designed by Prime Minister Research Fellows (PMRF) of IIT Delhi. It was a 40 Hrs certificate course. The purpose of the course was to teach the students beyond the classroom and help them to increases their potential to conduct valuable research. This course motivated them about the potential career in research. First-year undergraduates from Chemistry, Physical Sciences, Life Sciences and Biomedical Sciences attended the course. The course was taught by 10 PMRF of IIT Delhi for 2 hours on Saturdays from January 05, 2023-June17, 2023. In this curriculum, students learned-

1. Essential Research related software and search engine
2. How to plan any General Reaction (Organic and Inorganic)
3. Electrochemistry (Theory + Practical Experience)
4. General Text book Name Reaction and their Practical Experiment (Synthesis)

Main Attractions of the course were:-

- Training by PMRF (Prime Minister's Research Fellow) scholars from IIT Delhi.
- No fee was charged for this course.
- Certificate was provided after successful completion of the course.
- The successful candidate attended two days workshop in IIT Delhi to learn new techniques.

**Course Conveners**

Dr Pooja Bhagat

Prof Seema Makhija

## 2) Practical Training in Research Methodologies for College Students

The college conducted a certificate courses namely ‘"Practical Training in Research Methodologies" specifically for undergraduate students. The course was designed by Prime Minister Research Fellows (PMRF) of IIT Delhi. It was a 40 Hrs certificate course. The course aimed to expand students' horizons beyond the classroom, imparting practical skills outside the curriculum to foster a deeper connection with the world and guide towards rewarding career choices. Many students harbor untapped potential for impactful research and possess abundant knowledge, yet without motivation and clear direction, they may veer towards alternative career trajectories. Hence a 40-hour course was introduced with added value to the curriculum in an effort to teach or advise more and more students about the potential career in research. Course work was taught by the 10 PMRF Scholars of IITD on Saturdays and Sundays. The course was comprised of 5 units which were as follows:

1. Tutorials on the Chemdraw Software (08 hours)
2. Chemical bonding in conjugated π-systems – Theory and Computation (08 hours)
3. Tutorials on the Origin Software (08 hours)
4. How to Perform a Reaction (08 hours)
5. Theoretical Vs Practical (08 hours)

Main Attractions of the course were:-

- Training by PMRF (Prime Minister's Research Fellow) scholars from IIT Delhi.
- No fee was charged for this course.
- Certificate was provided after successful completion of the course.
- Students got the opportunity to work in the laboratories at IIT Delhi.

**Course Conveners**

Prof Pooja Bhagat
Prof Seema Makhija

## 3) e-workshop on ‘Learning the Basics of ChemDraw Software’

The college organized an e-workshop on “Learning the Basics of ChemDraw Software" on February 18, 2024, under the aegis of DBT-STAR College Scheme and Viksit Bharat Abhiyan. The aim was to familiarize students with the essential tool for creating chemical structures and to delve deeper into its functionalities.The workshop was conducted virtually using a combination of live demonstrations, interactive sessions, and hands-on exercises. Participants were provided with access to the ChemDraw software and relevant learning materials prior to the workshop. The sessions were structured to cover both basic and advanced aspects of ChemDraw. Mr. Ankit Rai, Prime Minister Research Fellow (PMRF), a PhD Scholar from the Department of Materials Science & Engineering at IIT Delhi, served as the resource person. The workshop saw active participation from nine students and concluded with an interactive assessment session.

**Workshop Conveners**

Prof Pooja Bhagat
Prof Seema Makhija

## 4) Workshop on ‘Exploring the Fundamentals of SciFinder’

The college organized a workshop on ‘Exploring the Fundamentals of SciFinder’ on March 14, 2024, as part of the DBT-STAR College Scheme and Viksit Bharat Abhiyan. The aim was to familiarize the participants with the functionalities and applications of SciFinder, a comprehensive scientific research tool widely used in academia and industry. The workshop sought to enhance participants' research skills and enable them to effectively utilize SciFinder for their scientific inquiries. Mr. Ankit Rai, a PhD Scholar from the Department of Materials Science & Engineering at IIT Delhi, served as the

resource person. The workshop saw active participation from eleven students and concluded with an interactive session.

**Workshop Conveners**

Prof Pooja Bhagat

Prof Seema Makhija

### 5) Tools and Techniques in Biological Sciences.

**Course Co-ordinator:** Prof. Seema Makhija, Prof. Pooja Bhagat

**Teaching Assistants:**

Ayesha Aiman, Jamia Millia Islamia Nuha Abeer Khan, Jamia Millia Islamia Kolli Venkata Supraja, IIT Delhi Preetha Ganguly, IIT Delhi

N. Jaya Lakshmi, IIT Delhi

Rupal Sarup, IIT Delhi

**Students in course:** B.Sc Students (1st to 3rd Year) and M.Sc Students (1st to 2nd Year)

**List of experiments for students:**

1. General safety instructions, documentation, labelling, common laboratory waste separation and management, storage instructions for bacteria, algae and mixed cell culturing with sterilization techniques.
2. Bacterial culturing techniques which involve streaking, spreading and pour plate culture for bacterial inoculation.
3. Preparation of competent cells and transformation of bacteria.
4. Isolation of bacteria from soil samples, further their growth in basic growth media.
5. Reading and writing research papers further student presentations on selected research topics.
6. Aerobic and anaerobic wastewater treatment systems, suspended and attached wastewater treatment systems.
7. Biochemical assays for nutrient estimations (nitrate phosphate and COD determination).
8. Basic questions on the calculation of molarity of the solution given to students as assignments and further, preparation of buffers.

**Learning outcomes**

Through this course, students not only acquire fundamental laboratory skills but also enhance their research learning and practical experience in biology. By engaging in experiments ranging from safety procedures to culturing techniques and biochemical assays, students develop critical thinking and problem-solving abilities essential for conducting scientific research. They learn to analyse and interpret data, critically evaluate research literature, and effectively communicate their findings through presentations and scientific writing. Moreover, hands-on experience in bacterial culturing, transformation, and environmental sample analysis fosters a fundamental understanding of microbiological experiments. In addition to laboratory skills, the inclusion of research paper presentations further enriches students; research learning and practical experience in biology. By presenting selected research topics to their peers, students hone their abilities in research writing, critical analysis, and communication. They learn to effectively summarize complex scientific concepts, articulate their ideas clearly, and respond to questions and feedback from their audience. This comprehensive approach not only strengthens their theoretical knowledge but also cultivates practical skills necessary for future careers in biology research and related fields.

# Appendix II
## Setting up of Advanced Instrumentation Facility

Establishing a Central Instrumentation Facility with state-of-the-art equipment for skill enhancement is a commendable initiative. Such a facility would greatly contribute to the development of technical skills, research capabilities, and innovation in various fields.CIF has the following state of art equipments for cutting edge research at UG level

### BIO-MEDICAL SCIENCE

| S. No. | Name of Equipment | Number of Units |
|---|---|---|
| **1.** | Laboratory Refrigerator | **2** |
| **2.** | PCR Machine with 1 KVA UPS | **1** |
| **3.** | 4 Gel Vertical Electrophores | **1** |
| **4.** | pH Meter, Labman Scientific Instruments | **3** |
| **5.** | Br Biochem Dual Wavelength Bench ((UV Transilluminator) | **1** |
| **6.** | Ice Flake Making Machine (IG-40FI) | **1** |
| **7.** | Technosource Dual wavelength Bench Top Type Transilluminator UV | **1** |
| **8.** | Magnus Microscope MLXI Plus LED Std Set | **7** |
| **9.** | Scalatec Weighing Scale with Load capacity of 220gm Resolution:o.oo1gm Pan Size:80mm. | **2** |
| **10.** | pH Meter with manual or Automatic with ATC probe, Benchtop | **2** |
| **11.** | IG-422Fume Hood | **1** |
| **12.** | Coslab's Magnetic Stirrer | **3** |
| 13. | Magnus Microscope MLXI Plus LED Std Set | 2 |

### BOTANY

| S. No. | Name of Equipment | Number of Units |
|---|---|---|
| **1.** | Bio Safety Cabinet (BSL-II Cabinet) | **1** |
| **2.** | UV-Visible double beam spectrophotometer | **1** |
| **3.** | Cilika Microscope BT-P | **1** |
| **4.** | Digital $C0_2$ Probe Wired Or Bluetooth | **1** |
| **5.** | Rotary Evaporator | **1** |
| **6.** | METERY LED display Chamber/Humidity Chamber | **1** |
| **7.** | Thermal Cycler with 1 KVA UPS | **1** |
| **9.** | Mushroom Growing Racks/MS Reck Work Material | **1** |
| **10.** | Scaletec Elcetronic Weighing Scale brand with load capacity of 220 gm. | **1** |
| **11.** | Humidifier | **1** |
| **12.** | Water Bath | **1** |
| **13.** | **HDPE Drum 210 ltr. capacity** | **2** |

## CHEMISTRY

| S. No. | Name of Equipment | Number of Units |
|---|---|---|
| **1.** | Gaussain Software V 16 | **1** |
| **2.** | Gauss View V 6 | **1** |
| **3.** | Eutech Microscope Based Automatic pH Meter | **1** |
| **4.** | Atomic Absorption Spectrophotometer with 8 Auto Lamp Turret & Variable Slit Control | **1** |
| **5.** | Hollow Cathod Lamp (Cadmium, Copper, Iron, Zinc) | **4** |
| **6.** | Exhaust Hood Vent Assembly | **1** |
| **7.** | N20 Nitrous Oxide Titanium Burner For AAS | **1** |
| **8.** | Potentiometer | **1** |
| **9.** | Centrifuge | **1** |
| **10.** | Conductivity Meter | **1** |
| **11.** | Hot Air Oven | **1** |
| **12.** | Rotary Evaporator | **1** |
| **13.** | **Potentiometer** | **1** |

## COMPUTER SCIENCE

| S. No. | Name of Equipment | Number of Units |
|---|---|---|
| **1.** | Hp Prodesk 600 G6 Microtower PC (CPU) | **25** |
| **2.** | HP laser MFP 136NW Printer Hp Multifunction Machine | **1** |
| **3.** | HP laser MFP 136NW Printer Hp Multifunction Machine | **2** |
| **4.** | White Interactive Board | 2 |

## ELECTRONICS

| S. No. | Name of Equipment | Number of Units |
|---|---|---|
| **1.** | Universal Dev B oard with FPGA and CPLD | **1** |
| **2.** | Setup for study of architecture of Mobile phone | **1** |
| **3.** | Set up for Satellite Communication System | **1** |
| **4.** | Control Labsetup with software and data acquisition | **1** |
| **5.** | AI Builder | **1** |
| **6.** | IoT Builder | **1** |
| **7.** | LDR,Photo diode and Photo transistor setup | **1** |
| **8** | LVDT setup | **1** |
| **9** | Electro-Optic Effect Setup | **1** |
| **10** | Fiberoptic sensor setup/kit | **1** |
| **11** | Young‘s Modulus Setup | **1** |
| **12** | E/em of ElectronBar Magnet Setup | **1** |
| **13** | Resistance transducer – Strain Gauge Setup | **1** |
| 14 | Mini-Microcentrifuges | 1 |

## PHYSICS

| S. No. | Name of Equipment | Number of Units |
|---|---|---|
| 1. | Complete setup to measure characteristics of DIAC, TRIAC & SCR | 2 |
| 2. | Type A – Multi Output (three) Regulated DC Power Supply | 10 |
| 3. | Complete trainer kit for studying Amplitude/ Frequency/ Phase Shift Keying Modulation & Demodulation | 6 |
| 4. | Complete trainer Kit for studying Pulse Amplitude / Position / Width Modulation & Demodulation | 6 |
| 5. | Complete Analog Communication Trainer Kit | 6 |
| 6. | 10 MHz Single Channel Function Generator | 6 |
| 7 | Complete setup to measure susceptibility of paramagnetic solution by Quincke's tube Method | 2 |
| 8 | Complete setup to plot B-H curve of iron using a solenoid | 2 |
| 9 | Complete setup to study characteristics of MOSFET, FET & UJT | 4 |
| 10 | Complete Hartley and Colpitt Oscillators Trainer set-up | 2 |
| 11 | Training Platform to study Flipflops, Shift Registers & Counters | 4 |
| 12 | Digital Storage Oscilloscope (DSO) | 4 |
| 13 | Complete setup for study of piezoelectric crystals | 3 |
| 14 | Programmable Portable Data Logger with touch screen interface | 1 |

## ZOOLOGY

| S. No. | Name of Equipment | Number of Units |
|---|---|---|
| 1. | BOD Incubator | 1 |
| 2. | Autoclave | 1 |
| 3. | Non-Refrigerated Centrifuge | 1 |
| 4. | Magnetic Stirrers | 2 |
| 5. | Horizontal Gel Apparatus | 2 |
| 6. | Double Distillation water Unit | 1 |
| 7. | Electronic Weighing Scale | 2 |
| 8. | Cilika Microscope BT-P | 1 |
| 9. | Mulitiparameter | 2 |
| 10. | pH Meter | 2 |
| 11. | Gel Documentation System | 1 |
| 12 | ECG 515 Refrigerator | 1 |
| 13 | EFGV450 20C Deep Freezer 45 Ltrs | 1 |
| 14 | Multitech Systems DC Regulated Power Supply. | 2 |
| 15 | Multitech Systems DC Regulated Power Supply. | 2 |
| 16 | Handheld UV Lamp 6 watt. | 1 |


ADVANCED CENTRAL INSTRUMENTATION FACILITY

# Appendix III

## Research Support

The College has set up Research Center for the faculty of the College for carrying out their research and also for mentoring UG students for research. Following are the resesrch laboratories in the college.

**Research Labs and Thrust Area: For Thurst area:**
**https://www.andcollege.du.ac.in/research/researchactivitybyfaculty**

| S.No | Research Lab | In charge of Research Lab | Department |
|---|---|---|---|
| 1. | Anti-mycobacterial Drug Discovery Laboratory | Prof. Urmi Bajpai | Biomedical Science |
| 2. | Chemical Biology Laboratory | Prof. Gagan Dhawan | Biomedical Science |
| 3. | Cancer and Thalassemia Screening Laboratory | Dr Sunita Jetly | Biomedical Science |
| 4. | Environmental Monitoring and Assessment Laboratory | Prof. Charu Gupta | Botany |
| 5. | Polymer Research Laboratory | Prof. Sunita Hooda | Chemistry |
| 6. | Computational Chemistry Laboratory | Prof. Pooja Bhagat | Chemistry |
| 7. | Computational and Synthetic Chemistry Laboratory | Prof. Shallu Sachdeva<br>Prof. Rashmi Thukral<br>Prof. Neeti Misra | Chemistry |
| 8. | Chemical Biology Research Laboratory | Prof. Seema Gupta<br>Prof. Manisha Jain | Chemistry |
| 9. | Advance Chemical Research Laboratory | Prof. Geetu Gambhir<br>Dr. Vikrant Kumar | Chemistry |
| 10. | Chemistry Research Laboratory | Prof. Neelu Dheer<br>Prof. Dinesh Kumar Arya<br>Prof. Pankaj Khanna | Chemistry |
| 11. | Material Science Laboratory | Prof. Amit Garg | Electronics |
| 12. | Device Modeling and Simulation Lab | Prof. Anju Agrawal<br>Dr Ravneet Kaur | Electronics |
| 13. | Mathematics Research Centre Laboratory | Dr Chaman Singh and Prof. Sadanand | Mathematics |

| | | | |
|---|---|---|---|
| | | Prasad | |
| 14. | Sensing Materials and Devices Laboratory | Prof. Arijit Chowdhuri | Physics |
| 15. | Chandra Computational Physics Lab | Prof. Subhash Kumar | Physics |
| 16. | Insect Vector and Pests Laboratory | Prof. Sarita Kumar | Zoology |
| 17. | Microbial Technology Laboratory | Prof. Monisha Khanna Kapur | Zoology |
| 18. | Ciliate Biology Laboratory | Prof.Ravi Toteja and Prof. Seema Makhija | Zoology |
| 19. | Embedded System and Robotics laboratory | Prof. Amit Garg | Electronics |
| 20. | Zebra Fish Culture Facility | Dr Monica Misra | Zoology |
| 21. | Mushroom Research and Skill Development Centre | Dr Anupama Shukla, Dr Anita Narang and Dr Vineet Kumar Singh | Botany |
| 22. | Sericulture Research Centre | Prof. Seema Makhija, Mr Sanjay Vohra | Zoology |
| 23. | Th!nk Laboratory: CUBE Laboratory in collaboration with HBCSE, Tata Institute of Fundamental Research, Mumbai | Exclusive student-run laboratory<br><br>Mentor: Prof. Sarita Kumar | _ |

**Ph.D. Awarded to the Research Scholars @ ANDC**

| S.No | Name of the Research scholar | Mentor | Title of the thesis | Year of Award/ Submission |
|---|---|---|---|---|
| **1** | Ms. Payal Das | Dr Monisha Khanna Kapur | Microbial extracellular enzymes: Purification, Molecular characterization and Applications | Ph.D. awarded in 2017 |
| **2** | Mr Eniyan Kandasamy | Dr Urmi Bajpai | Development of one-pot assay for screening multi-target inhibitors of *Mur* enzymes of *Mycobacterium tuberculosis* | Ph.D. awarded in 2018 |
| **3** | Ms Rama Kanta Choudhury | Dr Chandra Kanta Samal | Implementation of reliable path planning technique for mobile robots in presence of obstacles | Ph.D. awarded in 2018 |
| **4** | Ms Aarti Sharma | Dr Sarita Kumar | Synthesis, Evaluation and | Ph.D. awarded |

| | | | | |
|---|---|---|---|---|
| | | | Characterization of Phyto-mediated Silver Nano composites against Indian Strain of Dengue Vector, *Aedes aegypti* L. (Diptera: Culicidae | in 2019 |
| **5** | Mr Rajiv Kumar Shukla | Dr Sarita Kumar | Isolation, Identification and Biochemical Characterization of Bacteria as Potential Biological Control | Ph.D. awarded in 2019 |
| **6** | Mr Shyam Lal | Dr Sunita Hooda | Synthesis, characterization, kinetics and biological application of some metal complexes, June 2018. | Ph.D. awarded in 2019 |
| **7** | Mr Rakhi Saxena | Dr Sharanjit Kaur | Hierarchical Graph Decomposition for Scalable Network Analysis | Ph.D. awarded in 2019 |
| **8** | Ms S. Sripoorna | Dr Seema Makhija<br>Dr Ravi Toteja | Ciliates as cellular tool to assess heavy metal toxicity | Ph.D. awarded in 2022 |
| **9** | Mr Shani Kumar | Dr Amit Garg | Fabrication of Graphene Oxide Membranes for their Potential use in water Purification Applications | Ph.D. awarded in 2022 |
| **10** | Mr Prateek Kumar | Prof. Monisha Khanna Kapur | Structural analyses of bioactive compounds from Streptomyces spp. and identification of their biosynthetic gene clusters | Ph.D. awarded in 2022 |
| **11** | Ms Roopa Rani Samal | Prof. Sarita Kumar | Characterization of Mechanisms Involved in the Development of Acetamiprid and Deltamethrin Resistance in an Indian Strain of Aedes aegypti L. | Ph.D. awarded in 2022 |
| **12** | Ms Jeeva S. Abhraham | Prof. Seema Makhija | Taxonomy, Phylogeny and Molecular Systematics of Ciliates from Delhi, India | Ph.D. awarded in 2022 |
| **13** | Ms Drashya | Prof. Sunita Hooda | Design and Synthesis of Graphene Oxide and Chitin based Nanomaterials for Water Purification and Biological Application" | Ph.D. awarded in 2022 |
| **14** | Mr Vishal Dhingra | Prof. Amit Garg | Studies on Gas Sensing Properties of Graphene Oxide Post Tailoring | Ph.D. awarded in 2022 |

| | | | | |
|---|---|---|---|---|
| | | | throughSonication and Nanostructured Catalysts, Electronic Science | |
| **15** | Mr. Vinay Singh Dagar | Prof. Sarita Kumar | Studies on the Growth Regulatory effects of Emamectin Benzoate on the cotton bollworm, *Helicoverpa armigera* (Hübner) | Ph.D. awarded in 2023 |
| **16** | Ms Jyoti Rani | Prof. Urmi Bajpai | Computational Approach For Drug Repurposing in Tuberculosis And Pathway Modeling For Type 2 Diabetes Associated Tuberculosis. | Ph.D. awarded in 2023 |

**Ph.D. Students Enrolled under the Supervision of College Faculty**

| S. No. | Ph.D. student | Supervisor (Department) | Area of work | Registration (month, year) |
|---|---|---|---|---|
| **1** | Ms Ritu Arora UGC-SRF | Prof. Urmi Bajpai (Biomedical Science) | Bacteriohage lysins | November, 2017 |
| **2** | Mr Nawab Ziya Khan | | Cancer metabolomics | November, 2019 |
| **3** | Ms Kanika Nadar | | Mycobacteriophages | April, 2021 |
| **4** | Ms Bhawana Saini | Dr Sunita Jetly (Biomedical Science) | Thalassemia | March, 2023 |
| **5** | Ms Rinmi Kasar | | Thalassemia | September, 2023 |
| **6** | Mr Harekrushna Jena | Prof. Gagan Dhawan (Biomedical Science) | Design and development of synthetic vectors for the delivery of biomolecules | March, 2019 |
| **7** | Ms Akanksha Negi | | Polymeric nanoparticles: Design, synthesis and their applications in drug delivery | February, 2022 |
| **8** | Ms Vadant Soni | | Role of microbiota-derived metabolites in immune checkpoint blockade immunotherapy of colorectal cancer | February, 2022 |
| **9** | Mr Nitin Joshi | Prof. Charu Khosla Gupta | Assessing the impact of Climate change on | March, 2022 |

| | | | | |
|---|---|---|---|---|
| | | (Botany) | some native tree species of Delhi | |
| **10** | Ms. Anjana Singh | Dr Yasheswar (Botany) | Molecular characterisation of viruses infecting periwinkle (Catharanthus roseus L.) and alteration in secondary metabolites profile | December, 2020 |
| **11** | Mr Amit Kumar Paswan | Dr Sandeep Kumar Goel (Commerce) | Finance | January, 2023 |
| **12** | Ms Kirti Jain | Prof. Sharanjit Kaur (Computer Science) Co-Supervisor | Network analysis | November, 2018 |
| **13** | Mr Sumit Vashista | Prof. Anju Agrawal (Electronics) | Design and Simulation of Accoustic Emission Sensor for Geohazard Surveillance | January, 2023 |
| **14** | Ms Rupali Pandey | Prof. Amit Garg (Electronics) | Synthesis and Characterization of 2D Materials and their Applications | March, 2021 |
| **15** | Mr Sandeep Singhania | | Role of Functional Group in Gas Sensing of 2D Materials | January, 2022 |
| **16** | Ms Preeti Bharati | | Growth and Characterization of GaN based High Electron Mobility Transistors | January, 2022 |
| **17** | Ms Anju | | Engineered 2D Materials for Smart Biosensing | January, 2022 |
| **18** | Ms Ragini | | 2D material based Electrochemical and Spintronic | March, 2023 |
| **19** | Mr Ajay Kumar | Prof. Udaibir Singh (Electronics) | Fabrication and Modelling of Perovskite based Solar Cell | October, 2018 |
| **20** | Mr Dinesh Kumar | | Synthesis and Characterization of polymer nanocomposits thin film and its | May, 2019 |

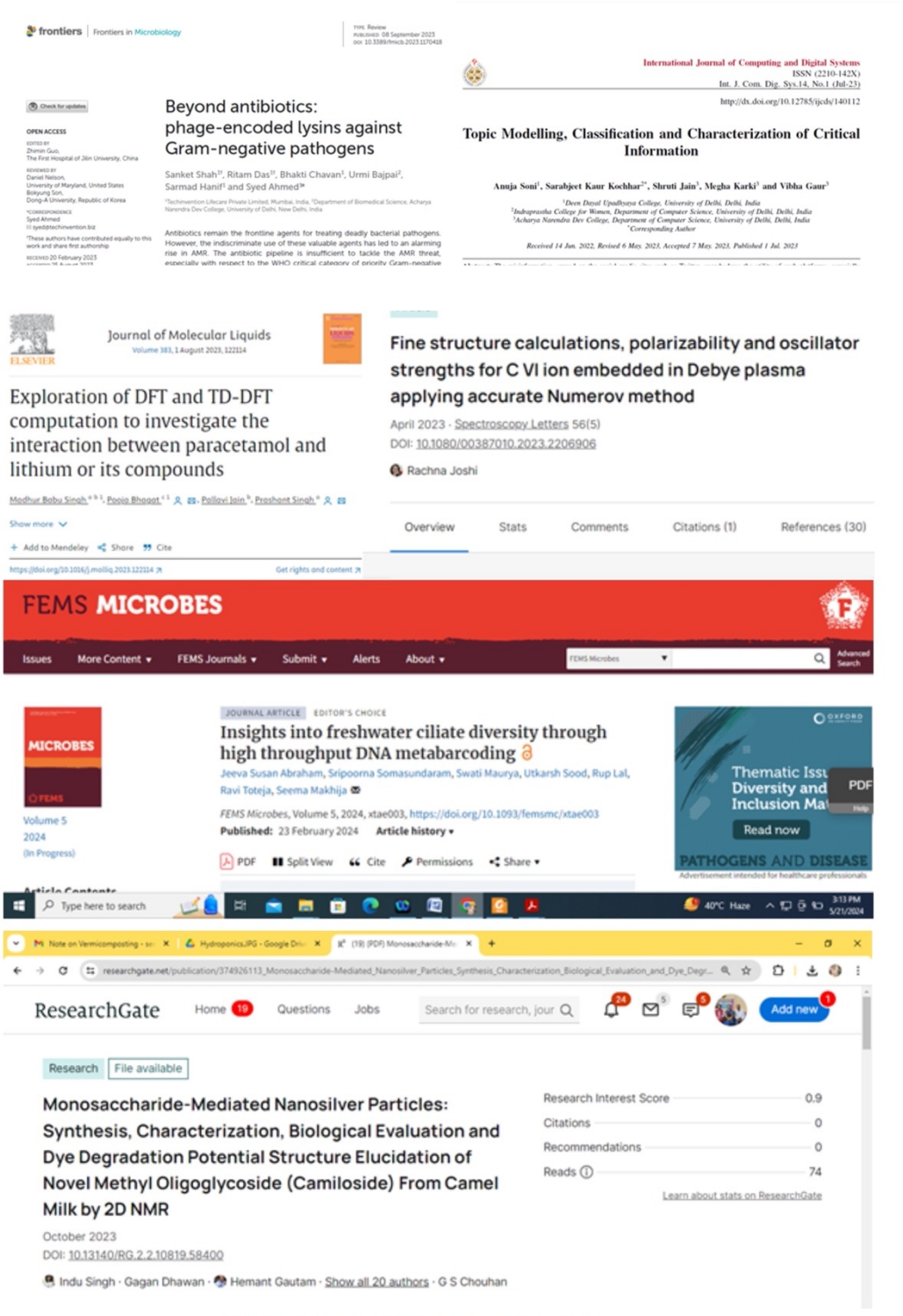
| | | | | |
|---|---|---|---|---|
| | | | application | |
| **21** | Ms Bhawna Singh | Prof. Sada Nand Prasad (Mathematics) | Non-Linear Dynamics | February, 2021 |
| **22** | Mr Itender Kumar | | Dynamical System | February, 2021 |
| **23** | Ms Sonia Aneja | | Dynamical System | January, 2022 |
| **24** | Ms Preeti Yadav | | Non-Linear Dynamics | January, 2022 |
| **25** | Ms Pooja Khoda | | Non-Linear Dynamics | February, 2023 |
| **26** | Mr Gurudatt Rao Ambedkar | Dr Chaman Singh (Mathematics) | Optimization | February, 2021 |
| **27** | Ms Jyoti Kohli | | Optimization | February, 2022 |
| **28** | Ms Garima Sethi | | Inventory Control and Management | July, 2021 |
| **29** | Mr Brijendra Yadav | | Optimization | January, 2023 |
| **30** | Mr Rohit Miglani | Prof. Arijit Chowdhuri (Physics) | Functional materials for Microwave Resonator | January, 2019 |
| **31** | Mr Ajay K. Sao | | Development of sensing layers for detection of chemical warfare (CW) agents/simulants | January, 2019 |
| **32** | Mr Jatinder Pal Singh | | Growth and characterization of some 2D materials for sensing applications | March, 2021 |
| **33** | Ms KungreiliuPanmei | Prof. Sarita Kumar (Zoology) | Effect of lufenuron on the growth and development of Aedes aegypti | March, 2018 |
| **34** | Ms P. Lanbiliu | | Effects of synergistic combinations of an IGR and beta-cyfluthrin on the growth and development of red cotton bug, Dysdercuskoenigii (Fabr.) (Hemiptera: Pyrrhocoridae) | November, 2018 |
| **35** | Mr Manu Sankar | | Characterization of diflubenzuron resistance in dengue vector, Aedes aegypti L. (Diptera: | November, 2019 |

| | | | | |
|---|---|---|---|---|
| | | | Culicidae) | |
| **36** | Ms Jyoti Falswal | | Taxonomic studies of non-Apis bees pollinators from North India | November, 2019 |
| **37** | Mr Sanjay Kumar | | Evaluation of the effects of Insect Growth Regulator on mosquito, Aedes aegypti L. | January, 2021 |
| **38** | Ms Divya Yadav | | Identification of novel insecticide targets in mosquitoes | March, 2022 |
| **39** | Ms Harsha | Prof. Monisha Khanna Kapur ( Zoology) | Bioactive potential of Streptomyces spp. against diverse pathogenic fungi | March, 2022 |
| **40** | Ms Swati Maurya | Prof. Ravi Toteja Prof. Seema Makhija (Zoology) | Microorganisms as Bioindicators in Diverse Environments | April, 2018 |
| **41** | Mr Sandeep | | Ecotoxicological studies on ciliates | January, 2021 |
| **42** | Ms Jyoti Dagar | | DNA Barcoding for ciliate species identification of India | February 2023 |
| **43** | Mr Hritik Kadian | Prof. Ravi Toteja (Zoology) (Co-Supervisor) | Assessing the Resistance, Tolerance and Bioremediation Ability of Selective Bioindicator Species (Algae, Ciliates and Macrophytes) to Different Persistent Bio-Accumulative and Toxic Substances | December, 2021 |
| **44** | Mr Ajay | Prof. Seema Makhija (Zoology) (Co-Supervisor) | Use of Freshwater Macrophytes for Fish Food Formulation | February, 2023 |
| **45** | Ms Bhumika | Dr Monica Misra (Zoology) Co-supervisor | Morphological and Molecular studies on Intestinal parasites of freshwater fish, *Channa striata* (Snakehead Murrel) from Meerut region | March, 2022 |

**Ph.D. Supervisors**

| S.No. | Name of the Faculty | Department |
|---|---|---|
| **1.** | Prof. Urmi Bajpai | Biomedical Science |
| **2.** | Prof. Gagan Dhawan | Biomedical Science |
| **3.** | Dr. Sunita Jetly | Biomedical Science |
| **4.** | Prof. Charu Khosla Gupta | Botany |
| **5.** | Dr. Yasheshwar (Co-supervisor) | Botany |
| **6.** | Prof. Sunita Hooda | Chemistry |
| **7.** | Prof. Seema Gupta | Chemistry |
| **8.** | Prof. Pankaj Khanna | Chemistry |
| **9.** | Prof. Sandeep Kr. Goel | Commerce |
| **10.** | Dr. Shalu Mahajan | Commerce |
| **11.** | Prof. Sharanjit Kaur | Computer Science |
| **12.** | Prof. Vibha Gaur | Computer Science |
| **13.** | Prof. Chandra Kanta Samal | Computer Science |
| **14.** | Prof. Anju Agrawal | Electronics |
| **15.** | Prof. Amit Garg | Electronics |
| **16.** | Prof. Udaibir Singh | Electronics |
| **17.** | Prof. Laxmi Narain | Mathematics |
| **18.** | Prof. Sadanand | Mathematics |
| **19.** | Dr. Chaman | Mathematics |
| **20.** | Prof. Arijit Chowdhuri | Physics |
| **21.** | Prof. Sarita Kumar | Zoology |
| **22.** | Prof. Monisha Khanna Kapur | Zoology |
| **23.** | Prof. Ravi Toteja | Zoology |
| **24.** | Dr. Monica Misra (Co-supervisor) | Zoology |
| **25.** | Prof. Seema Makhija | Zoology |

Physical Area of Research Wing: **4318 sq.ft.**



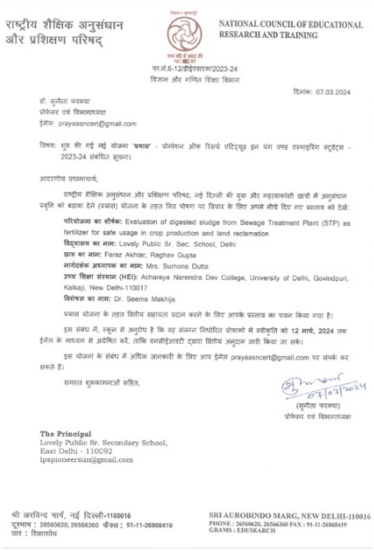

RESEARCH SUPPORT AT ANDC


RESEARCH SUPPORT AT ANDC

# Appendix IV
# Hosting International Conferences, Workshops and Outreach Programs

## International Conference on Chemical and Biological Sciences (ICCBS-2024)

Acharya Narendra Dev College (University of Delhi) co-organized three days International Conference on Chemical and Biological Sciences (ICCBS-2024) being organized by the Department of Chemistry under the aegis of Internal Quality Assurance Cell (IQAC), Atma Ram Sanatan Dharma College (University of Delhi) in association with Kwangwoon University (South Korea), North-West University (South Africa), and SRM Institute of Science & Technology (Ghaziabad) from January 27th to 29th, 2024. The conference aimed to unite the global academic community in a shared endeavor, to explore the latest developments and breakthroughs in the domains of Chemistry, Computational Chemistry, Drug Development, Bioenergy, Bioinformatics, Plasma Biosciences, Environment, Plasma Physics, and Biological Sciences. The conference included keynote session, invited and oral talks. The Conference attracted 282 participants from various backgrounds, including experts, researchers, and academics. The conference featured 38 invited speakers from countries including the USA, Brazil, Singapore, South Korea, South Africa, Japan, UAE, and Canada, enriching the discussions with their expertise. A total of 221 oral presentations were delivered, covering a wide range of topics within the chemical and biological sciences domain. The event also included the recognition of excellence through 12 Best Oral Presentation Awards, acknowledging outstanding contributions and innovative research. Furthermore, prominent journals ChemBioChem and Chemistry and Biodiversity of Wiley Publisher will publish special issues dedicated to the conference's submitted papers, enhancing the dissemination of cutting-edge research and fostering ongoing collaboration within the scientific community. The conference covered key themes, including Advances in Chemical Synthesis, Biological Systems and Applications, Environmental Impact and Sustainability, Computational Modeling and Data Analysis, and Emerging Technologies and Innovations, and it comprehensively explored the subject matter. Insights gained from discussions during the conference revealed emerging trends, challenges, and opportunities in the chemical and biological sciences, setting the stage for future collaborations, research endeavors, and advancements. In conclusion, the International Conference on Chemical Biological Sciences was a testament to the collaborative efforts and dedication of the global scientific community, driving forward the frontiers of knowledge and innovation in the field.



राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्

NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

पत्र सं.6-12/प्रियेप्रयास/2023-24
विज्ञान और गणित शिक्षा विभाग

दिनांक: 07.03.2024

डॉ. सुनीता चरक्या
प्रोफेसर एवं विभागाध्यक्ष
ईमेल: prayaasncert@gmail.com

विषय: शुरू की गई नई योजना 'प्रयास' - प्रोजेक्शन ऑफ रिसर्च एटिट्यूड इन योग एण्ड एक्सट्रीम स्टूडेंट्स - 2023-24 संबंधित सूचना।

आदरणीय प्रधानाचार्य,

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्, नई दिल्ली की युवा और महत्वाकांक्षी छात्रों में अनुसंधान प्रवृत्ति को बढ़ावा देने (प्रयास) योजना के तहत चित्र चोयना पर विचार के लिए अपने मौजे दिए गए प्रस्ताव को देखें:

**परियोजना का शीर्षक:** Evaluation of digested sludge from Sewage Treatment Plant (STP) as fertilizer for safe usage in crop production and land reclamation
**विद्यालय का नाम:** Lovely Public Sr. Sec. School, Delhi
**छात्र का नाम:** Faraz Akhter, Raghav Gupta
**मार्गदर्शक अध्यापक का नाम:** Mrs. Sumona Dutta
**उच्च शिक्षा संस्थान (HEI):** Acharaya Narendra Dev College, University of Delhi, Govindpuri, Kalkaji, New Delhi-110017
**विशेषज्ञ का नाम:** Dr. Seema Makhija

प्रयास योजना के तहत वित्तीय सहायता प्रदान करने के लिए आपके प्रस्ताव का चयन किया गया है।

इस संबंध में, स्कूल से अनुरोध है कि यह संलग्न निर्धारित घोषणा में सशोधनों को **12 मार्च, 2024** तक ईमेल के माध्यम से अवश्यित करें, ताकि समझौताज्ञापन दूसरा वित्तीय अनुदान आगे किया जा सके।

इस योजना के संबंध में अधिक जानकारी के लिए आप ईमेल prayaasncert@gmail.com पर संपर्क कर सकते हैं।

सभावत शुभकामनाओं सहित,

(सुनीता चरक्या)
प्रोफेसर एवं विभागाध्यक्ष

**The Principal**
Lovely Public Sr. Secondary School,
East Delhi - 110092
lpspioneerwan@gmail.com

श्री अरविन्द मार्ग, नई दिल्ली-110016
दूरभाष : 26560620, 26566360 फैक्स : 91-11-26868419
तार : शिक्षासंशोध

SRI AUROBINDO MARG, NEW DELHI-110016
PHONE : 26560620, 26566360 FAX : 91-11-26868419
GRAMS : EDURESEARCH

**Department of Chemistry**
**under the aegis of**
**Internal Quality Assurance Cell,**
**Atma Ram Sanatan Dharma College**
**(University of Delhi)**

in Association with

**Kwangwoon University, South Korea**
**North-West University, South Africa**
**Acharya Narendra Dev College, University of Delhi**
**SRM IST, NCR Campus, Ghaziabad**

*presents*

***International Conference***
*on*
***Chemical and Biological Sciences (ICCBS)***

**27th - 29th January, 2024**

The conference aims to unite the global academic community in a shared endeavor and to explore the latest developments and breakthroughs in the domains of Chemistry, Computational Chemistry, Drug Development, Bioenergy, Bioinformatics, Plasma Biosciences, Environment, Plasma Physics, and Biological Sciences.

**Mode of Conference - Online**


INTERNATIONAL CONFERENCES, WORKSHOPS AND OUTREACH PROGRAMS

## FDP on Sericulture: Rearing and its Applications

**Coordinators:** Prof. Seema Makhija
**Co-Cordinators:** Prof. Pooja Bhagat, Prof. Geetu Gambhir, Mr. Sanjay Vohra
**Date: August 08-14, 2023**
**Number of Participants: 21**

University of Delhi (Skill Enhancement Course Committee) in Collaboration withAcharya Narendra Dev College, University of Delhi(under the aegis of DBT STAR COLLEGE and IQAC)Department of Zoology, University of Delhi, Shaheed Rajguru College of Applied Sciences for Women, University of Delhi, Guru Nanak Angad Dev TLC, SGTB Khalsa College, University of Delhi, Atma Ram Sanatan Dharma College, University of Delhi has organized one week FDP on ‘ Sericulture: Rearing and its Applications’ from August 08, 2023 to August 14, 2023. The aim of the FDP was to enhance the skill of the participants by providing hands-on training and insight knowledge in the field of sericulture.
There were 21 participants who are faculty members in different colleges of Delhi University. Total four sessions were conducted everyday. During the FDP eminent scientists like Dr. S. B. Dandin, Director (Rtd), CSB & Ex VC, Dr. N. Krishna Kumar, Former Director, NBAIR, (ICAR), Dr. ThallapallyMogili, Scientist (Rtd), Central Sericultural Research and Training Institute, Mysuru and Dr Deepti Gupta, Professor, IIT Delhi. They enlightened all the participants with the latest development in the field of Sericulture. Various aspects of Sericulture covered during the FDP were:

(1) Scenario of Sericulture in India
(2) Rearing of silk worm
(3) Post Coccon Technology
(4) Use of Pupae in Livestock Feed and Cosmetics
(5) Biotechnological applications of insect-plant interactions in silkworms

All the faculty participants were asseesed after the FDP by following the UGC norms like assignments, tests and submission of project proposals.

## National Workshop on Biological Data Analysis

**Convener: Dr. Rashmi Sharma, Dr. Archna Pandey and Prof. Seema Makhija**
**Date: January 27-31, 2024**
**Number of Participants: 37**

The Biological Data Analysis Workshop conducted at Acharya Narendra Dev College, University of Delhi, spanning five days, provided a comprehensive platform for students from diverse academic backgrounds to delve into the intricacies of data analysis in the realm of biology. With attendees ranging from undergraduate students to Ph.D. scholars hailing from disciplines such as Zoology, Botany, Biomedical Sciences, Computational Biology, Microbiology, and others, the workshop aimed to equip participants with essential skills and knowledge crucial for navigating the rapidly evolving landscape of biological research. The workshop was in online mode. It included a 45 minute lecture by different experts and 3-hr hands-on session by Alok Anand every day. This workshop included "Gen AI 4 Healthcare," Biomedical Image Data Analysis, Fundamentals of Biostatistics, Personalized Medicine and Big Data in Healthcare, and Prompt Engineering for Biomedical Data Sciences

In conclusion, the Biological Data Analysis Workshop facilitated an enriching learning experience for participants, offering a holistic understanding of the pivotal role of data analysis in driving breakthroughs in biological research and healthcare. By bridging the gap between theoretical knowledge and practical application, the workshop served as a catalyst for fostering a new generation of adept and skilled professionals poised to tackle the challenges and opportunities in the field of

biological data analysis.Throughout the workshop, spanning from Day 1 to Day 5, participants engaged in immersive, three-hour hands-on sessions dedicated to R programming for Biological Data Analysis, by Alok Anand. These sessions commenced with a comprehensive introduction to programming fundamentals, gradually progressing towards advanced topics such as data visualisation and statistical analysis techniques tailored for biological datasets. Under the guidance of expert instructors, students gained practical experience in leveraging R's powerful capabilities, equipping them with the skills necessary to manipulate, analyse, and visualise biological data effectively, thus fostering a deeper understanding of the principles and methodologies underlying biological research.

### One Day Workshop on IOT and Cloud Computing

**Coordinator: Prof. Chandra Kanta Samal**
**Date: February 29, 2024**
**Number of Participants: 80**

Acharya Narendra Dev College is an educational and research-oriented hub of eminence of India under University of Delhi. It envisages proffering quality education to its students while emboldening them with diverse exposure and hands-on research.. The speaker conducted the sessions with valuable content with focus on the following topics:

**(1)** Session I: Cloud Computing
**(2)** Session II: IoT (Internet of Things)

Overall, the workshop sessions offered a balanced blend of theoretical insights and hands-on experiences, empowering attendees with the knowledge and skills needed to navigate the dynamic landscapes of cloud computing and IoT. The session was attended by around 80 participants. It was very valuable and informative not only for students but also for the faculties. Participants were interactive and showed keen interest in the workshop.

### One Day Workshop Hands on Experience in Blockchain

**Coordinator: Prof. Chandra Kanta Samal**
**Date: March 05, 2024**
**No. of Participants: 128**

This workshop was divided into two sessions, each focusing on different aspects of blockchain technology and its practical applications.

In the first session, participants were introduced to the Concept of blockchain as a decentralized digital ledger that transparently records transactions viewable by anyone. The session delved into the workings of Solana, a blockchain platform utilizing proof-of-stake consensus mechanisms.

The second session focused on Ethereum and Ether, a cryptocurrency similar to Bitcoin. Participants learned about Ethereum as a decentralized platform and its role as a repository for Ether. Hands-on experience was provided with Solidity, a programming language used to develop smart contracts on the Ethereum blockchain. Participants also created wallets on Meta-mask and Phantom and gained insight into private keys, public addresses, and other essential tools and norms within the Crypto-World. Overall, participants found the workshop to be highly informative and enriching. The hands-on activities and practical demonstrations were particularly well-received, as they provided valuable insights into real-world applications and usage scenarios.

### Hands – on Training workshop on Arduino Microcontrollers and PCB Designing

**Coordinator: Prof. Arijit Chowdhary, Prof. Chandra Kanta Samal**
**Date: March 18-22, 2024**
**No. of Participants: 42**

Department of Physics, Department of Computer Science and Internal Quality Assurance Cell (IQAC), Acharya Narendra Dev College, University of Delhi organised a "Hands – on workshop on Arduino Microcontrollers and PCB designing" from 18 – 22 March 2024 under the aegis DBT STAR College scheme.The two-day hands-on workshop on Arduino microcontrollers was designed and conducted with the objective of introducing college students to the fundamentals of microcontroller programming and interfacing, with a focus on the versatile and widely used Arduino platform. Hosted by the aforementioned departments, this workshop took place on 18 & 19th March 2024 drawing enthusiastic participation from students across various disciplines eager to delve into the realms of electronics and embedded systems. Ms. Babita Sharma and Mr. Satyam Garg, were the resource persons for the same.
Building upon the foundational knowledge from the first day, the second day of the workshop was structured around more complex projects and an introduction to the Internet of Things (IoT) using Arduino**.**The two-day hands-on workshop on Arduino microcontroller successfully achieved its goal of introducing college students to microcontroller programming and interfacing, with an emphasis on practical learning and project-based activities. The enthusiastic participation and positive feedback from the students underscored the growing interest in embedded systems and IoT, areas that are rapidly evolving and have immense potential for innovation. As technology continues to advance, workshops like these play a crucial role in equipping the next generation of engineers and technologists with the skills and knowledge to lead future developments.

## Three-Day Hands-On Workshop on Designing and Fabrication of Printed Circuit Boards (PCBs)

**Coordinator: Prof. Arijit Chowdhary, Prof. Chandra Kanta Samal**
**Date: March 18-22, 2024**
**No. of Participants: 42**

The workshop began with an opening address by Mr. Arun Kumar who highlighted the workshop's objectives and the significance of PCBs in the current electronics industry. Following this, the first day was structured to introduce participants to PCB design fundamentals and familiarize them with essential software tools. PCB design process was also the focus. Participants were taught how to use simulation software to model and analyze their circuit designs for performance under various conditions. Mr. Arun Kumar demonstrated simulations involving signal integrity, power integrity, and electromagnetic interference (EMI). Hands-on activities included running simulations on designs created by participants, interpreting results, and making necessary adjustments to their designs. The final day was dedicated to the fabrication and assembly process of PCBs, providing participants with a comprehensive view of bringing their designs to life.
The three-day workshop on PCB design and fabrication provided a unique platform for college students to gain valuable insights and practical experience in the electronics manufacturing process. By covering a broad range of topics from basic design principles to advanced simulation techniques and fabrication processes, the workshop equipped participants with the skills necessary to excel in their future projects and careers in electronics engineering. The success of this workshop underscores the importance of hands-on learning experiences in technical education and the department's commitment to fostering innovation and excellence in engineering.

## Workshop on Graphical Abstract and Career in Publishing

**Conveners: Dr. Archna Pandey**
**Organizing Team: Dr. Satendra Singh, Dr. Rimpy Kaur Chowhan, Dr. Ritu Khosla and Dr. Deepshikha**
**Date: March 08, 2024**

**Number of Participants: 72**

The Department of Biomedical Science at Acharya Narendra Dev College, University of Delhi, organised a workshop titled "Graphical Abstract and Careers in Publishing" aimed at educating participants on the importance of graphical abstracts in scientific publications and exploring career opportunities in the publishing sector. Dr. Lipsa Panda, the Communication Head at Elsevier, delivered an engaging presentation highlighting the significance of graphical abstracts and providing insights into their creation process. She stressed how graphical abstracts enhance research visibility and comprehension, offering techniques to transform written content into visually appealing summaries for better reader understanding. Participants gained valuable knowledge and skills essential for improving the visibility of their research and exploring career paths in publishing. Dr. Lipsa Panda's expertise greatly enriched the workshop experience, empowering attendees to effectively communicate their research findings and pursue opportunities in the publishing field.

## Intercollege Hands-on Workshop on Foldscope

**Conveners: Dr. Archna Pandey**

**Organizing Team: Dr. Satendra Singh, Dr. Rimpy Kaur Chowhan, Dr. Ritu Khosla and Dr. Deepshikha**

**Date: February 14, 2024**

**Number of Participants: 100**

The Foldscope Workshop, hosted by the Department of Biomedical Science as part of their annual fest Cathexis'24. The workshop was led by Professor Uma Chaudhary from Bhaskaracharya College of Applied Sciences, University of Delhi. Approximately 100 students from various colleges of the University of Delhi and other universities attended the workshop.Professor Chaudhary and her team provided hands-on experience with the Foldscope Microscope. The workshop began with a brief introduction to the microscope, highlighting its importance, origin, and the underlying idea behind its creation. Participants were then guided through the assembly process of the Foldscope, using simple materials such as paper cuttings, pieces of magnets, and a lens. The demonstrators explained the concept thoroughly, and the team was supportive and cooperative in assisting the students to understand and assemble the microscope.By the end of the workshop, each participant had successfully assembled their own Foldscope Microscope, allowing them to explore the world of tiny organisms. This hands-on experience sparked curiosity among the students about microscopic organisms and their environment, enhancing their understanding of the microbiological world. Overall, the workshop provided a valuable learning opportunity for students, enabling them to engage with microscopy in a practical and meaningful way.

## Workshop on Aryuveda and Nutrition

**Convenor: Dr. Geetika Kalra**

**Date: November 30, 2023**

**Number of Participants: 75**

Workshop on Aryuveda and Nutrition was organized by the Department of Botany. The workshop emphasized on the ayurvedic way of taking care of body and mind. Resource person, Dr Ramesh Guguloth explained in detailed manner about individual prakriti and shared a questionnaire to assess ones's prakriti and advised to act accordingly. Ayurveda is a traditional Indian system of medicine, emphasizes a holistic approach to health, striving to maintain balance between mind, body, and spirit. Ayurvedic practices encompass herbal remedies, dietary guidelines, and lifestyle recommendations customized to an individual's unique constitution or dosha. Ayurveda offers a holistic approach to

restoring balance in the body, mind, and consciousness, addressing the root causes of our discomfort and promoting overall well-being.

### National Symposium & Hands on Training on Ecosystem Restoration & Sustainability

**Convenor- Prof. Charu Khosla Gupta**
**Date: February 22-23, 2024**
**Number of Participants: 80**

The two-day symposium on ecosystem restoration for sustainable development, aimed to address the pressing issues of habitat loss, species extinction, and climate change-induced landscape degradation. With a focus on India's commitment to achieving land degradation neutrality by 2030, the symposium brought together stakeholders from academia and government bodies to discuss innovative approaches and collaborative efforts for ecological restoration. The Symposium incuded: Ecological Restoration for India's Commitment to the Bonn Challenge and UN Decade of Ecosystem Restoration (2021-2030). The symposium provided a platform for interdisciplinary dialogue and knowledge exchange on the challenges and opportunities associated with ecosystem restoration. By bringing together experts, practitioners, and students, the event underscored the importance of collaborative action in addressing the ecological crisis and advancing sustainable living practices.

### National Workshop on Raising Awareness on Urban Air Quality, Climate Change, Health and e-Resillience

**Convener: Prof. Ravi Toteja and Prof. Seema Makhija**
**Date: November 28, 2023**
**Number of Participants: 77**

Promoting environmental awareness and responsibilities, Acharya Narendra Dev College, University of Delhi, organized the National Workshop in collaboration with Environmental Pollution Laboratory (EPL), Department of Environmental Studies, University of Delhi, sponsored by Department of Science and Technology (DST), Government of India**.**The workshop titled ‘Raising Awareness on Urban Air Quality, Climate Change, Health and e-Resillience’ was hosted by Department of Zoology, ANDC, on November 28$^{th}$, 2023. Prof. Ravi Toteja, officiating principal, ANDC, welcomed the guests and initiated the program by lighting the lamp along with invited speakers and faculty members. Chief guest Prof. Shachi Shah, Head, SOITS, IGNOU addressed the audience and highlighted the importance of science and different visions in it for the world. Prof. Chirashree Ghosh, Department of Environmental Studies, University of Delhi, was the key resource person of the event. She along with her team emphasized on the actual causes and condition of air in the National Capital. She kept the session quite interactive and passed the valuable information to the budding youth. Students were made aware about the lung health and were given knowledge about spirometer also in the hands on session led by Dr. Arun Kumar where he actually tested the lung health of two of the individuals from the audience and interpreted the results and their importance as well. Air quality session was followed by the much needed lecture of the time by Prof. Namita Rajput, Shri Aurobindo College, University of Delhi, on‘Creating safe campus: Understanding and Implementing UGC guidelines for Gender Sansitization'. She imparted such required information in a very friendly manner and awared all about the rules and punishments under different sections as mentioned by UGC for the prevention of sexual harrasment of women in the work place. After this informative session, students were bought back to the nature by interesting talk delivered by Mr. Gaurav, Assistant Professor, Ramanujan College, University of Delhi, on ‘Snakes in the city’. Being someone immersed in snakes and their study, he succeeded in developing the students' interest in the same as well by displaying the real images and

videos of his own encounters with snakes of the Capital region. He also delivered lecture on different classes and species of snakes found and their basis of classification.

## Hands on Workshop on Basic Language Skills

**Convener: Prof. Pooja Bhagat**
**Date: August 07-11, 2023**
**Number of Participants: 15**

Acharya Narendra Dev College (University of Delhi) organised a Hands on Workshop – Basic Language Skills under the aegis of DBT Star College Scheme and IQAC from August 7-11, 2023. Prof. Ravi Toteja, Officiating Principal of the college, was the patron of the workshop. Under his able guidance and with the help and support of Prof. Pooja Bhagat, coordinator of the event, the 5 day workshop was conducted successfully. 15 students of the college participated in the workshop. Dr. Joita Dhar Rakshit, Assistant Professor, Department of English, ANDC, was the resource person of the hands on workshop. She covered the 4 basic skills of language – listening, speaking, reading and writing – on the first four days. The last day was dedicated to revision, queries, doubts and clarifications. During the course of the workshop, the participants were given hands on experience in the language lab of the college. Using the Orell software in the language lab, they had practical sessions on the four basic skills of language. The students found the hands on experience interesting and very helpful and enthusiastically attended all the sessions. On the last day, certificates were given to those participants who had successfully completed the 5 day workshop by Prof. Ravi Toteja. Overall, the participants responded positively and expressed the desire to participate in more such workshops in the future.

## Workshop on Machine Learning with Python

**Faculty Advisor (ANDC SPIE Student Chapter):** Prof. Amit Garg
**Event Convenor (DBT STAR Coordinator):** Dr. Ravneet Kaur
**Date:** September 25-29, 2023
**Number of participants: 40**

SPIE Student Chapter, ANDC, in collaboration with Brain Mentors Pvt Ltd, organized a comprehensive 5-day workshop on Machine Learning with Python from September 25 to September 29, 2023. Guided by the esteemed industry trainer Mr. Kumar Kaushik, the workshop aimed to provide an in-depth exploration of machine learning, data science, and Python, emphasizing their real-world applications. With a commitment to fostering expertise in emerging technologies, SPIE ANDC welcomed over 40 participants to this immersive learning experience. The mai themes of the workshop were:

(1) Introduction to AI and Python Basics
(2) Building Python Foundations
(3) Exploring NumPy and Jupyter Lab
(4) Introduction to Pandas for Data Manipulation
(5) Building a Recommendation Program

The workshop successfully equipped participants with valuable knowledge and hands-on experience, aligning with SPIE ANDC's commitment to nurturing expertise in emerging technologies.

## Workshop on 3D Printing Technology

**Faculty Advisor (ANDC SPIE Student Chapter):** Prof. Amit Garg
**Event Convenor (DBT STAR Coordinator):** Dr. Ravneet Kaur
**Date:** September 23, 2023

**Number of participants:** 35

On September 23, 2023, the SPIE Student Chapter at Delhi University hosted a one-day workshop centered on 3D printing technology. The primary objective of the workshop was to equip students with a thorough comprehension of 3D printing technology, encompassing its historical evolution, diverse types of 3D printers, and its wide-ranging industrial applications. Mr. Shivansh Bhatnagr, a former member of the SPIE Chapter, served as the workshop's resource person, adhering to the Train the Trainer philosophy. He underwent a six-month dissertation supervised by the Chapter's Faculty Advisor, Prof. Amit Garg, to gain expertise in this domain. The workshop was divided into two sessions: a theoretical session and a practical demo session.In the theoretical session, the resource person introduced the participants to the history and progress of 3D printing technology. He also discussed the different types of 3D printers and their industrial applications.In this session, participants learned the basics of Blender and how to use it to create simple 3D models.The second session was a practical demo session. In this session, participants were divided into seven groups of five students each. Each group was given a hands-on demo on a Flash Forge 3D printer. The participants learned a lot about 3D printing technology. They also had the opportunity to get hands-on experience with 3D printers. The workshop was a valuable learning experience for all participants.

## Workshop on Internet of Things

**Faculty Advisor (ANDC SPIE Student Chapter):** Prof. Amit Garg
**Event Convenor (DBT STAR Coordinator):** Dr. Ravneet Kaur
**Date:** February 26 - March 1, 2024
**Number of participants:** 50

SPIE ANDC conducted a 5-day workshop on IoT with Brain Mentors Pvt. Ltd. from 26th February 2024 to 1st March 2024. Immersed in the intricacies of smart devices, sensor networks, and data analytics, participants discovered the workshop as a crucible that honed their skills and ignited their creative sparks. The impact of this newfound knowledge is anticipated to resonate long after the workshop, fostering a community driven by a relentless pursuit of technological excellence. From its inception to its culmination, the workshop embodied the essence of innovation, providing participants with a comprehensive understanding of IoT's ever-evolving landscape. Enthusiastically embracing the challenge, participants delved into unraveling the complexities of interconnected devices, sensor networks, and the transformative power of data-driven insights. It was a hands-on workshop that was beginners friendly. All the participants were divided into 15 teams and each team comprised of 3 members. On the first day, students were given a basic introduction to IoT and informed about the communication protocols, and by the end of the evening students had completed the setup of their respective Raspberry Pi boards, downloaded the Operating system and connected with the micro-computer with the Laptop. On the first day, students were able to implement a basic program related to Blinking of LED. On the second day, participants were asked to implement complex tasks including a traffic light controller, and were given more exposure to the working of various sensors like PIR sensors, buzzers, ultrasonic sensors, and temperature and humidity sensors. Furthermore, on the third day, students started with the revision of the code related to the ultrasonic sensor, buzzer, and PIR sensor. Students learned more about the Bluetooth module and learned how to tackle the problems related to interfacing with the laptop. On the fourth day, a basic introduction to Databases and SQLite was given to students using Raspberry Pi. Since many students were facing problems related to networking and connecting the Bluetooth module, they were guided by the mentor on how to do troubleshooting related to this sensor. Sensor interfacing related to OLED was completed and how to display messages on the screen with the line of code. Using ultrasonic sensors and humidity sensors, students have learned how to collect data and upload it on the cloud platform.Finally, on the five days,

an alternative approach was introduced to connect the Bluetooth module with the laptop. Students were asked to implement a complex project, namely making a motion detection using a PIR sensor which first includes uploading data on the Thingspeak (cloud platform) and then again fetching the same data. This marks real-time decision-making using data that is fetched a second time from the cloud. And then do decision-making based on the data depicting the change in the angle of the servo motor. Ultimately, It was an engaging workshop and showed the real-time application of IoT.

**Outreach Activities - College Level**

1. **SPIE optics education outreach programme 2023:** SPIE, the International Society for Optics and Photonics, has a longstanding commitment to outreach initiatives. The College was proud recipients of SPIE Optics Outreach Education Programme 2023 grant. Teaching optics education at the X standard level can be challenging for educators. Traditional methods like using old blackboards and presentations may not be as effective when it comes to providing hands-on experience with real3D operations using Ray Optics Kits and helping students understand the physical presence of optical instruments. However, integrating these practical elements significantly enhances the learning experience, enabling students to visualize complex concepts at a deeper level. Student Chapter at Acharya Narendra Dev College (ANDC) adopteda unique approach for its Optics Outreach Activity in 2023 across various schools. This approach places practical,hands-on experiences at the forefront of the outreach program. Aligned with the new education policy of 2020, which emphasizes practical knowledge in teaching physics, the University of Delhi's ANDC SPIE Student Chapter conducted workshops in 22 schools across Delhi. Notably, half of these schools were government-funded institutions with a total student participation of around 1200. The workshops were conducted in the months of August and September, 2023.The culmination of SPIE Optics Outreach Education Programme marked a significant event in the annals of Acharya Narendra Dev College, as we had the privilege of hosting a distinguished physicist and educator, Professor H.C. Verma, as our Chief Guest on 06 October, 2023.As part of our initiative, we distributed Ray Optics Kits and optical instruments, which were conceived and designed by the Chapter, to every participating school free of charge.

2. **PRAYAS Project with NCERT**: Department of Education In Science and Mathematics has for the very first time launched a scheme named PRAYAAS ( Promotion of Research Attitude In Young and Aspiring students 2023 – 2024). In this scheme school students had to send a research Project in collaboration with College and was selected for the Project titled Evaluation of digested sludge from Sewage Treatment Plant (STP) as fertilizer and safe usage in crop production and land reclamation. Lovely Public Sr.Sec. School,P.D.Vihar was selected in collaboration with HEI partner ANDC. Under urban private school category only 5 schools were selected and out of that from all over Delhi the Project of only Lovely public Sr.Sec School in collaboration with Acharya Dev Narendra Dev College got selected. Two school students are working in this project. A total grant of Rs. 50,000/- was sanctioned in this project.

3. **Outreach Workshop: One Day Inter-College Workshop on Rearing and Breeding of Zebra Fish: Opportunity and Scope:** Organised Intercollege workshop for students from different college of the University of Delhi on September 23, 2023. The zebrafish workshop is a vital platform for students. The goal is to impart essential knowledge and skills related to zebrafish as a model organism. Participants learnt zebrafish husbandry, genetics and techniques enabling them to build interest for scientific research in zebrafish.

4. **Scientific Writing and Communication**: The one-day ISME sponsored Hands on Workshop on "Scientific Writing and Communication" was organized jointly by Acharya Narendra Dev College, University of Delhi and PhiXgen Pvt. Ltd., under the aegis of IQAC and DBT Star College Scheme on February 13, 2024. This workshop was organized with the motive to upskill young minds for students who are keen on learning scientific writing and how to publish in high impact journals.The workshop touched on various elements of scientific paper like title, abstract, introduction, methods, results, tables and figures, discussion, references etc. The workshop provided a platform to researchers, postgraduate & undergraduate students and even school students to learn to present their findings and review their works in the form graphics. The workshop enlightens on how to become effective writers using research data and represent it in easy and best possible way. It also shed light on the format of a scientific manuscript, peer review, funding etc.The workshop was conducted in offline mode and total of 97 student registrations were received along with around 20 faculty members from University of Delhi. The Workshop was conducted with a total number of 97 participants (school students, undergraduate, postgraduate and PhD students and faculty) to gain knowledge and hands on training on various aspects of scientific writing and communication.

# Appendix V
# Green Initatives

## 1. Hydroponics

Hydroponics is a soil-less method of growing plants using nutrient rich water solutions. It allows for efficient use of water and land resources, can be practiced indoors as well as in urban settings. It often results in higher yields as compared to traditional soil-based farming. This technology can be excellent tool for teaching students about sustainable agriculture, plant biology and environmental science. With this agenda in mind, the department of Botany of the college proposed to install a hydroponics unit since it can provide numerous benefits to college community. Hydroponics has also been introduced as a complete GE and Skill Enhancement course in the newly introduced "National Education Policy" with a vision to empower students at the undergraduate level. In times to come, it would serve as a research tool for studying agriculture in controlled environments. Additionally, it aligns with the growing interest in urban farming and can contribute to community outreach initiatives.

## 2. Vermicomposting

Vermicomposting is a process of composting organic waste using worms, typically red wigglers (*Eisenia fetida*) or red earthworms (*Lumbricus rubellus*). The worms consume organic matter, breaking it down into nutrient-rich compost called vermicompost or worm castings. Vermicomposting can be done on a small scale, such as in a backyard compost bin or worm bin, or on a larger scale for commercial purposes. The process produces high-quality compost that is rich in essential nutrients, beneficial microorganisms, and enzymes, making it an excellent soil amendment for gardening and agriculture. Vermicomposting helps reduce the volume of organic waste sent to landfills, mitigating environmental pollution and promoting sustainability. The continuously escalating organic waste generation on the campus posed a problem for its storage and disposal. A viable and sustainable waste management strategy has been employed at ANDC in the form of vermicomposting, an eco-friendly and sustainable solution for waste management and soil enrichment.

Vermicomposting, a biological process involving earthworms, offers a promising solution by converting organic waste into a valuable resource while simultaneously enhancing soil quality. It relies on the synergistic activities of earthworms and microorganisms to decompose organic matter. Earthworms ingest organic waste, partially digest it, and excrete nutrient-rich castings, known as vermicompost. This process enhances microbial activity and accelerates decomposition, resulting in the production of stable, humus-like compost.

Vermicompost possesses a balanced nutrient profile, enriched with nitrogen, phosphorus, potassium, and micronutrients essential for plant growth. Additionally, vermicompost enhances soil structure, water retention capacity, and aeration, promoting root development and microbial diversity. Its slow-release nutrient dynamics foster sustained plant growth and resilience to environmental stressors.

The setting up of vermibeds in the college campus has served several purposes in providing hands on training to students pursuing Skill Enhancement Courses of Biofertilizers and Organic Cultivation; utilization and effective consumption of campus generated organic waste and providing nutrient rich organic amendment for college gardens and flower- beds.

Both hydroponics and vermicomposting offer sustainable alternatives to traditional agricultural practices, promoting resource efficiency, environmental conservation, and improved plant growth. Integrating these methods into farming and gardening practices can contribute to a more resilient and productive food system.




GREEN INITIATIVES AT ANDC

# Appendix VI
# Awards/Accolades/Publications of Students

## Fellowships Received by ANDC Students from External Sources

### Meritorious Students' Award from Government of Delhi

The Directorate of Higher Education, Government of NCT of Delhi rewards the toppers from Delhi Government funded colleges of University of Delhi. The amount of this fellowship is Rs. 10,000/- (Rupees Ten Thousand only) and all ANDC students are eligible for this. This Year, the fellowship is awarded to the following students:

| S. No. | Name of the student | Course, Year | Amount (Rs.) |
|---|---|---|---|
| **1.** | Jyoti Sharma | B. Sc. (P) Life Sciences, III Year | 10,000/- |
| **2.** | Anamta Islam | B. Sc. (H) Electronics, III Year | 10,000/- |
| **3.** | Pushkar Baranwal | B. Sc. (H) Electronics, III Year | 10,000/- |
| **4.** | Gurpreet Kaur | B. Sc. (H) Maths, III Year | 10,000/- |
| **5.** | Priyanshi Gupta | B. Sc. (H) Maths, III Year | 10,000/- |
| **6.** | Pulkit Narayan Pandey | B. Sc. (H) Maths, III Year | 10,000/- |
| **7.** | Pushkar Pandey | B. Sc. (H) Maths, III Year | 10,000/- |
| **8.** | Somiya Kapoor | B. Sc. (H) Maths, III Year | 10,000/- |
| **9.** | Sukanta Sarkar | B. Sc. (H) Maths, III Year | 10,000/- |
| **10.** | Sunidhi Khanna | B. Sc. (H) Maths, III Year | 10,000/- |

### Hindustan Petroleum Corporation Limited Scholarship

Hindustan Petroleum Corporation Limited is Maharatna Company under MoPNG, Govt. of India. HPCL has always believed in creating shared values and delivering happiness through its various initiatives that have touched millions of lives. In the continued endeavor, HPCL wishes to distribute scholarships to SC/ST/OBC and PWD students studying in graduation and post graduation courses. The current scholarship scheme of HPCL for Students in the category of Scheduled Caste, Scheduled Tribes, Other Backward Classes and Persons with Disabilities gives support for their education. This year, the award is given to the following students:

| S. No. | Name of Student | S. No. | Name of Student |
|---|---|---|---|
| 1 | Abhishek | 30 | Kirti Yadav |
| 2 | Abhishek Kumar | 31 | Krishna Agrawal |
| 3 | Aditya | 32 | Lalit Kumar |
| 4 | Aditya Kumar | 33 | Manish Verma |
| 5 | Aditya Kumar Singh | 34 | Mohd Tabish |
| 6 | Aditya Raj Sah | 35 | Monu |
| 7 | Akanchha Kumari | 36 | Nishant Kumar |
| 8 | Alka Raju | 37 | Pallavi Saini |
| 9 | Alok Singh | 38 | Payal |
| 10 | Alshad S | 39 | Pranjal Verma |
| 11 | Aman Kumar | 40 | Prashant Kumar |

| | | | |
|---|---|---|---|
| 12 | Amarjeet Kumar | 41 | Prayag Yadav |
| 13 | Amit Rathore | 42 | Rakhi |
| 14 | Anshu | 43 | Ravi Tomer |
| 15 | Ashwani Kumar | 44 | Rishipal |
| 16 | Ayush Chaudhary | 45 | Riya Verma |
| 17 | Bhawna Kumari | 46 | Rohit |
| 18 | Chandan Kumar | 47 | Rohit Maurya |
| 19 | Chandan Kumar Shah | 48 | Roshan Kumar |
| 20 | Deepak Jaswal | 49 | Sarita |
| 21 | Devang Kamal | 50 | Sumit |
| 22 | Devansh Panwar | 51 | Tripti |
| 23 | Dhananjay Kumar | 52 | Vinod |
| 24 | Gulshan Kumar | 53 | Vipin Kumar |
| 25 | Gyan Prakash | 54 | Vishal Gupta |
| 26 | Himanshi Nagar | 55 | Vishal Kashyap |
| 27 | Jagdeesh Arya | 56 | Yadvender |
| 28 | Jitender | 57 | Yash Kumar |
| 29 | Keshav | 58 | Yashraj Aditya |

### Meritorious Students'Award from University of Delhi

Faculty of Science, University of Delhi rewards the meritorious students who are pursuing science courses from colleges of University of Delhi. The amount of this award given is Rs. 3,000/- (Rupees Three Thousand only) which is to be used by the student for the purchase of books. This year, the award is given to the following seven students:

| S. No. | Name of the student | Course, Year |
|---|---|---|
| **1** | Prince CP | B. Sc. (H) Physics, I Year |
| **2** | Amal Joshi | B. Sc. (H) Chemistry, I Year |
| **3** | Somsuvra Das | B. Sc. (H) Physics, III Year |
| **4** | Bindu | B. Sc. (H) Physics, III Year |
| **5** | Mohini Kumari | B. Sc. (H) Botany, III Year |
| **6** | Radhika Garg | B. Sc. (H) Zoology, III Year |
| **7** | Khushi Goyal | B. Sc. (H) Zoology, III Year |

### Dark pattern buster hackathon (DPBH) 2023

Dark Patterns Buster Hackathon is a pioneering initiative aimed at equipping students with a platform to combat deceptive design practices in the digital world. The mission of Department of Consumer Affairs, Government of India, is to foster a culture of ethical innovation and problem-solving, addressing the pressing issues we encounter in our online experiences. In this regard, the Department of Consumer Affairs in collaboration with IIT-

BHU organised an event DPBH 2023. In this national level event under-graduate students from various central/state universities were encouraged to participate.Acharya Narendra Dev College (ANDC), University of Delhi, is recognised as one of the nodal centres for the DPBH 2023. Prof. Ravi Toteja, Principal, ANDC provided the opportunity to the Department of Computer Science to organise rounds of the event. Dr. Preeti Marwaha, associate professor, Department of Computer Science, was appointed as Nodal Officer. Dr. Sunita Narang, associate professor and Dr. Arunita Chaukiyal, senior technical assistant,Department of Computer Science, were additional coordinators. Adi Maqsood and Nishant Pratap Singh were student coordinators. Twelve student teams comprising around 40 students of ANDCand other colleges participated in round 1, where these teams submitted the abstract/idea to IIT-BHU. College then organised round 2 on 30th Jan. 2024 as intra-college competition where below mentioned 9 teams participated. This round was evaluated by jury members namely, Prof. Puneet Azad, Dr. Nikhil Rajput, Prof. Sharanjit Kaur and Prof. C. K. Samal. Out of 9 teams, 5 teams (Team1, 4, 5, 6, 7) got selected for round 3 and visited IIT-BHU during 16-18 Feb., 2024 for showcasing their posters. Further, these teams were selected for round 4 which is an international event organized on 15th mar., 2024 celebrating the world's consumer day.

**Awards won by the Students**

1. Hariom Chaudhary, B. Sc. (H) Biomedical Science, II Year was awarded First position in the quiz competition held during the One Day Workshop on Scientific Writing and Communication organized by ANDC in association with International Society for Microbial Ecology (ISME) on February 13, 2024.
2. Prashant Tiwari, B. Sc. (H) Biomedical Science, II Year was awarded Third prize in CaseCrack Competition organized during Entrepreneurship Summit 2023 by Udmodya Foundation, a Section 8 Company of University of Delhi, to celebrate World Entrepreneur's Day on August 21, 2023.
3. Saarthak, B.Sc. (H) Biomedical Science, II Year was selected for Vice Chancellor Internship Scheme ,2023 for six months in Faculty of Science, University of Delhi and was awarded 30,000/-.
4. Chandan Kumar, B. Sc. Computer Science III year, secured second position in Typing Titans organised during AGON'24 by the Department of Computer Science, Shyam Lal College(Evening).
5. Aman Sharma, B. Sc. (H) Computer Science III year, won 'Top performing lens of the month' during Lens Creator rewards Programme at Snapchat.
6. Riyansh Sharma, Shrishti Rawat, Ayush Yadav, Shubh Sankhyadhar, B. Sc. (H) Computer Science III year, were round 4 finalists of the Dark Patterns Buster Hackathon 2023 organised by IIT-BHU and Ministry of Consumers Affairs on 17th February, 2024.
7. Megha, Avishkaar, Ayush Bhardwaj, Arpit Bhardwaj, B. Sc. (H) Computer Science III year, were round 4 finalists of the Dark Patterns Buster Hackathon 2023 organised by IIT-BHU and Ministry of Consumers Affairs on 17th February, 2024.
8. Piyush Singh, Rohan,Sagar, presented a solution on Dark Patterns (Dark Guard) at Dark Pattern Buster Hackathon, 2024, IIT BHU Varanasi on 17th February, 2024.
9. Adi Maqsood, Nishant Pratap Singh, Abhishek Kumar, Shivanshi Rajpoot, Himmanshu Yadav, presented solution on Dark Patterns (Ethical Eye) at Dark Pattern Buster Hackathon, 2024, IIT

BHU Varanasi on 17th February, 2024.

10. Shubh, B.Sc.(H) Computer Science 3rd year , secured first position in the Data Science Exhibition organised by ANDC.
11. Naman Beri, B.Sc(H) Electronics, I Year Secured second position in hackathon event in the annual Technical fest of Shaheed Rajguru college for applied science for womenElectromania'23 of held on November6, 2023.
12. Ms. Sudhanshu Kumar, B.Sc. (H) Electronics- I Year awarded scholarship certificate for being selected by Skill India Scholarship program 2023-24.
13. Sakshi Singh and Harsh Kumar, B.Sc. (H) Zoology- I Year were awarded first Prize in the Oral presentation entitled " Extraction of Sericin from cocoon and silk waste" in the International Conference on Global Scenario and Sustainable solutions inSilk industry held at Bharat Tex Expo on February 28, 2024.
14. Gifty Saini and Ahmed Bilal, B.Sc. (H) Zoology- I Year were awarded first Prize in the Oral presentation entitled "Cultivating cordyceps by usings silkworm as a substrate" in the International Conference on Global Scenario and Sustainable solutions inSilk industry held at Bharat Tex Expo on February 28, 2024.
15. Sakshi Singh, B.Sc. (H) Zoology- I Year is certified Viksit Bharat Ambassdor.
16. Anshika Sharma B.Sc. (H) Zoology- III Year was awarded First Prize in Small Story Writing Competition in Hindi Diwas 2023 organized by Jesus and Mary College, University of Delhi.

## Publications by Undergraduate Students

1. Gaur,V., **Yadav, R**., and Kaur, R. (2023) A Quantitative Approach to Prioritize Causes of Air Pollution in Delhi. *Indian Journal of Environmental Protection (IJEP*), Vol. 43(11).
2. **Rana, A., Bhatnagar, S.,** Garg, S. and Garg, A. (2023) A pedagogical approach to wavelength division multiplexing measurements using 3D printing and Arduino. *Physics Education*. 38(6).
3. **Rana, A., Bhatnagar, S.,** Garg, S. and Garg, A. (2023) Wide frequency range optical chopper system: an affordable solution using 3D printing and Arduino Uno. *Physics Education*. 38(6).
4. **Jha, A, Rana, A,** Garg, S., Singh, A. and Garg, A. (2023) Real-time Face Mask Detection with an Auto Alarm using Arduino Uno. Accepted for publication in "The Journal of Research and Studies." (ISSN: 2455-5401).
5. **Roy, K., Garg, S., Rana, A., Tomar, S**. and Garg, A. (2023) An Innovative Approach to Measuring Spring Constants: Utilizing 3D Printing and Sound Sensing with Improved Time Resolution in Data Collection. Accepted for publication in Physics Education Journal, India

1. Gaur,V., **Sinha, A.** and Kaur, R. (2023). An Intelligent Covid Management System for Pre Schools. In: Mishra, A., Gupta, D., Chetty, G. (eds) Advances in IoT and Security with Computational Intelligence. ICAISA 2023. Lecture Notes in Networks and Systems, vol 755. Springer, Singapore. https://doi.org/10.1007/978-981-99-5085-0_25.
2. **Jha, A**., Gaire,P., Kaur, R. and Bhattacharya, M. (2023) IoT Based Smart Drainage System. In: Mishra, A., Gupta, D., Chetty, G. (eds) Advances in IoT and Security with Computational Intelligence. ICAISA 2023. Lecture Notes in Networks and Systems, vol 755. Springer, Singapore. https://doi.org/10.1007/978-981-99-5085-0_23.

## UG student Conference Presentation (2023-2024)

1. **Hariom Chaudhary** (2024). Genome and Transcriptome Data Analysis for Novel Target Identification and Characterization at the International Conference on Structural Biology and Drug Discovery (ICSBDD-2023) organised by University School of Biotechnology, Gautam Buddha University, Greater Noida, Uttar Pradesh from October 11-12, 2023.

2. **Ilma Khan, Aayushi Rajput, Saya L,** Gambhir G, Narang A, Verma M, Hooda S, Nanocomposites of Cobalt Oxide grafted Magnetic Tamarind as a promising Bioadsorbent for Reactive Blue19 Dye,Poster Presentation Session International conference on Integrative Chemical Science for Health &Environment, ICHE-2023, held from 6th – 8th October 2023, New Delhi, India, Organized by Deshbandu College in Association With Indian Association of Solid State Chemist and Allied Scientist, Augusta University, USA, Indian Society of Chemist & Biologist.
3. **Rajput A S, Anugrah K S**, Saya L, Hooda S, Verma M, Rani S, Study of Role of Nyquist Plot and Graphical Analysis of Electrochemical Impedance Spectroscopy Data for biopolymer added magnetite samples, Poster Presentation Session International conference on Integrative Chemical Science for Health &Environment, ICHE-2023, held from 6th – 8th October 2023, New Delhi, India, Organized by Deshbandu College in Association With Indian Association of Solid State Chemist and Allied Scientist, Augusta University, USA, Indian Society of Chemist & Biologist.
4. **Sakshi Singh and Harsh Kumar,** B.Sc. (H) Zoology, I Year did Oral presentation entitled " Extraction of Sericin from cocoon and silk waste" in the International Conference on Global Scenario and Sustainable solutions inSilk industry held at Bharat Tex Expo held on February 28, 2024.
5. **Gifty Saini and Ahmed Bilal**, B.Sc. (H) Zoology, I Year did Oral presentation entitled "Cultivating cordyceps by usings silkworm as a substrate" in the International Conference on Global Scenario and Sustainable solutions inSilk industry held at Bharat Tex Expo on February 28, 2024.
6. **Rishabh Ojha and Saloni**, B.Sc. (H) Zoology, I Year did Oral presentation "Reshaamitra" An online application for sericulture waste management" in the International Conference on Global Scenario and Sustainable solutions inSilk industry held at Bharat Tex Expo on February 28, 2024.

## Presentation By Intern Students From Amity University

1. A Study of thermal stability of multi component FuntionalizedBiocomposite materials, 2nd International conference on Advance Interdisciplinary Research (ICAIR-2023), Jointly organized by DigvijayNath Post Graduate College, Gorakhpur, UP and Science Tech Institute, Lucknow, online oral presentation , April 7-9, 2023
2. Preferential absorption behaviour of methylene blue dye onto the surface of MPVA-GO Nanocomposite, 2nd International Symposium on Emerging Trends in Synthesis and Catalysis (ETSC-2023), Organized by Amity Institute of Applied Sciences, Amity University, Uttar Pradesh, Mode-offline poster presentation, 12-13 April, 2023.

## UG Dissertations

(1) Mayank Rathi of B.Sc. (H) Mathematics submitted dissertation entitled Synchronization of Chaos in Electronic circuits as part of DSE course under the mentorship of Dr. Roopesh Tehri and Prof. Amit Garg

(2) The following two students did their final year projects in 3D printing under the supervision of Prof. Amit Garg:
   (1) Ankush Rana
   (2) Shivansh Bhatnagar

## Training Programs/Internships Attended by the Students

1. Ms. Sudhanshu Kumar, B.Sc. (H) Electronics, I year completed 4-week course from university of EDINBURGH, British Council on Learning for a sustainable Future on December 3, 2023.
2. Aman Sharma, B. Sc. Computer Science III year, participated in the under 25 Snapchat opinion leader programme for 9 months organised by Snapchat.
3. Shubh Sankhyadhar, B.Sc.(H) Computer Science, III year, did a 6 month internship in Director South Campus office, University of Delhi under VCIS as a Research and Web development intern.
4. Preksha, B. Sc. (H) Biomedical Science, III year successfully completed an internship training program at Hiyoshi Corporation, Japan on 'Training on Operation and Maintenance of Water Purification Plant and Domestic Wastewater Treatment Facilities, Food and Environmental Analysis' and also, on 'Market Research for Environmental Business in India' from May 22, 2023 to July 14, 2023.
5. Saarthak, B.Sc. (H) Biomedical Science, II Year completed a lab training in the Department of Genetics, University of Delhi South Campus under the able guidance of Prof. B.K Thelma from 14th Jan to 14th April 2023.
6. Mr Abhay Gupta, B.Sc. (H) Zoology, III Year, Completed internship titled "Techniques on Collection, PreservaMtion and ldentification of Insects" at Zoological Survey of India, Northern Regional Centre, Dehradun from June 05 to July 14, 2023.
7. Mr Dhruv Bhasin, B.Sc. (H) Zoology, III Year, Completed internship titled "Techniques on Collection, Preservation and ldentification of Insects" at Zoological Survey of India, Northern Regional Centre, Dehradun from June 05 to July 14, 2023.
8. Ms. Anshika Sharma, B.Sc. (H) Zoology, III Year was Intern at Central Library, DU, under VCIS from November 2023 - April 2024.

## Participation by Students in Various Conferences/Workshops

1. Mr. Sudhanshu Kumar, B.Sc. (H) Electronics, I Year participated in the training workshop on IoT Organised by 5G Indigenous Test Bed O&M Team of IIT Delhi on January 25, 2024.
2. Mr. Sudhanshu Kumar, B.Sc. (H) Electronics, I Year participated as delegate in TATVAVDHAN an initiative by TATVA: The Eco Club of Ramanujan College, University of Delhi on the occasion of International Forest Day and world water day on April 22, 2024 at Ghalib Conference Hall, Ramanujan College.
3. Mr. Sudhanshu Kumar, B.Sc. (H) Electronics, I Year participated in the workshop: Entrepreneurship Decoded conducted by Nova an Entrepreneurship idea presentation of Natural particle on May 11, 2023.
4. Mr. Sudhanshu Kumar, B.Sc. (H) Electronics, I Year participated in the International Virtual Conference on Emerging Technologies in Materials Science (ICETM 2024) on 22.02.2024 organised by PG & Research Centre of Physics in collaboration with Consultancy cell , Jayaraj Annapackiam College for Women (Autonomous), Periyakulam-625601, Theni District, Tamil Nadu.
5. Mr. Sudhanshu Kumar, B.Sc. (H) Electronics, I Year participated as student volunteer from Acharya Narendra Dev College in "In Hope: I Dare Diyva Utsav -2023" held on 4-5 December, 2023 at Thyagaraj stadium, Delhi organised by the Office of the State Commissioner for Persons with Disabilities, the Department of Social Welfare, and the Directorate of Education, Government of Delhi.
6. Mr. Sudhanshu Kumar, B.Sc. (H) Electronics, I Year participated in IoTronics: A Training Program on IoT organised by Deen Dayal Upadhaya College (DDUC), University of Delhi

(DU), New Delhi on October 13-14, 2023.

7. Aditya Maurya, B.Sc. (Hons) Computer Science, II year, participated in a 4-day photography workshop organised by the Culture Council of Delhi University.
8. Ananya, B.Sc. (Hons) Computer Science, I year, attended the Tech for Good Conclave 2024 organised by NASSCOM Foundation at India Habitat Centre.
9. Ananya, B.Sc. (Hons) Computer Science, I year, took part in a walkathon on cancer at JLN Stadium organised by CAN Foundation..
10. Himanshu Yadav, B.Sc. (Hons) Computer Science, I year, participated in Navigating Digital Frontier: Empowering students for academic success.
11. Himanshu Yadav, B.Sc. (Hons) Computer Science, I year, participated in Navigating Digital Frontier and attended a talk on Cyber Security Awareness.
12. Sapna Kumari,Awani Yadav of BSc(H) Computer Science, 1 Year attended Inauguration Ceremony and launch of 'Common Fellowship Portal' organised by Ministry of Science and Technology at National Media Centre, New Delhi on 12th March 2024.
13. Ishitva Joshi ,Udita Puri ,Inshirah ,Kriti Misra,Himanshu Yadav ,Sakshi Verma ,Jayesh Raj Neti participated in Dark Patterns Buster Hackathon 2023 organised by IIT BHU at Acharya Narendra Dev College from 16 Jan to 21 Feb 2024.
14. Nishant Pratap Singh, B.Sc(H) Computer Science, II year presented a webinar on Youth Empowerment in the Digital Age: Embrace Change, Transform Future organised by Maharaja Surajmal Institute Of Technology, GGSIP University on 22nd November 2023.
15. Adi Maqsood, B.Sc(H) Computer Science, II year presented a webinar on Youth Empowerment in the Digital Age: Embrace Change, Transform Future organised by Maharaja Surajmal Institute Of Technology, GGSIP University on 22nd November 2023.
16. Mayank Kumar, B.Sc(H) Computer Science, II year presented a webinar on Youth Empowerment in the Digital Age: Embrace Change, Transform Future organised by Maharaja Surajmal Institute Of Technology, GGSIP University on 22nd November 2023.
17. Nishant Pratap Singh, B.Sc(H) Computer Science, II year, worked as student organiser of V-Lab Development Workshop (Bootcamp 2.1), organised by Department of Computer Science, Acharya Narendra Dev College, UoD, held between 11 - 15 March 2024.
18. Mayank Kumar, B.Sc(H) Computer Science, II year, worked as student organiser of V-Lab Development Workshop (Bootcamp 2.1), organised by Department of Computer Science, Acharya Narendra Dev College, UoD, held between 11 - 15 March 2024.
19. Megha, B. Sc. (Hons) Computer Science, III year, participated in a Technical talk on quantum computing and cybersecurity, which was held online.
20. Megha, B. Sc. (Hons) Computer Science, III year,, participated in a Workshop on Data Dive: Surfing the waves of AI innovation organised by Turing Society. The workshop was held online.
21. Aishani Vashisht, B. Sc. (H) Biomedical Science, I Year participated and worked as resource person in SPIE Modern Optics Workshop .
22. Enas Shirin Fatma, B. Sc. (H) Biomedical Science, I Year participated in the 'Nari Shakti Conclave' organized by the Viksit Bharat Ambassador Events on 7trh March 2024 and is a certified 'Viksit Bharat Ambassador' now.
23. Danish Razdan, B. Sc. (H) Biomedical Science, I Year participated in the open seminar on "How to Prepare for Civil Services Exam" organized by Career Counseling and Placement Cell, ANDC in association with Drishti IAS on October 26, 2023.
24. Hariom Chaudhary, B. Sc. (H) Biomedical Science, II Year appeared for Mimamsa 2024 Prelims organized by IISER, Pune on January 28, 2023.

25. Hariom Chaudhary, B. Sc. (H) Biomedical Science, II Year participated in G20 University Connect organised by the Ministry of External Affairs and Research and lnformation System for Developing Countries (RIS), New Delhi, held at Bharat Mandapam on September 26, 2023.
26. Hariom Chaudhary, B. Sc. (H) Biomedical Science, II Year participated in Global Bio India 2023 - Biosciences and Bioeconomy organised by the DBT, BIRAC and Association of Biotechnology Led Enterprises (ABLE) held at Bharat Mandapam from December 4-6, 2023.
27. Hariom Chaudhary, B. Sc. (H) Biomedical Science, II Year attended the lecture entitled 'How We Sense Pain' by David Julius on held at Jawaharlal Nehru Auditorium, AIIMS, New Delhi on January 19, 2024.
28. Hariom Chaudhary, B. Sc. (H) Biomedical Science, II Year participated in the Social Awareness Program on Cleanliness and Hygiene for Pediatric Patients & their Attendants on October 07, 2023 organised by Bhore Living Humanly Foundation (NGO). Prashant Kumar, B. Sc. (H) Biomedical Science, II Year participated in Entrepreneurship Summit 2023 organized by Udmodya Foundation, a Section 8 Company of University of Delhi, to celebrate World Entrepreneur's Day on August 21, 2023.
29. Prashant Kumar, B. Sc. (H) Biomedical Science, II Year worked as a resource person in the outreach program "SPIE Optics Outreach Education Programme 2023" organized from August 04- September 06, 2023 by SPIE Student Chapter, University of Delhi at ANDC in different schools across Delhi NCR.
30. Preksha, B. Sc. (H) Biomedical Science, III Year participated in the 13th Experimental Course in Water Quality organized by Kyoto University of Advanced Science (KUAS), Japan on July 11, 2023.

## DBT Star grant helping UG Students Garner Scholarships for PG Students Abroad

1. **Ms. Himanshi Jain** (2020-23) batch of B.Sc. (H) Biomedical Science has garnered scholarship to pursue research master's program in Molecular Mechanisms of Disease (research) from Radbound University, Netherlands.
2. **Mr. Ankush Rana** (2020-23) batch of B.Sc. (H) Electronics has garnered DSU (Diritto allo Studio Universitario) scholarship to pursue M.Sc. Electronics Engineering, Polytechnic University of Milan, Italy.
3. **Mr. Kalpajit Roy** (2020-23) batch of B.Sc. (H) Physics has garnered Erasmus Mundus fellowship for Joint Master degree on Nanoscience and Nanotechnology wherein his 1st year is in KU Leuven, Belgium and 2nd year in UGA Grenoble, FRANCE (specialisation in quantum and nanoscale engineering)
4. **Mr. Prahlad Sharma** (2020-23) batch of B.Sc. (H) Physics has garnered scholarship to pursue Masters in Nanotechnology, Sapienza University of Rome, ITALY. He also got full scholarship to join Masters in Physics (specialization in Condensed Matter Physics), University of Messina, Italy
5. **Mr. Prashant Verma** (2020-23) batch of B.Sc. (H) Physics has garnered scholarship to pursue Masters in Physics (specialization in Condensed Matter Physics), University of Messina, Italy.
6. **Mr. Ankush Rana** (2020-23) batch of B.Sc. (H) Electronics has garnered DSU (Diritto allo Studio Universitario) scholarship to pursue M.Sc. Electronics Engineering, Polytechnic University of Milan, Italy.

## UG Research Awarded @ National and International Platform

1. Subhanshu Krishna, Mohd.Afham and Vridhi Singh: First prize in Botanophily, the paper presentation competition at Infloresecence' 2023 organized by Sanjeevani, the botanical society of Hindu College, University of Delhi on 5th April 2023.
2. Sakshi Singh and Harsh Kumar, B.Sc. (H) Zoology, I Year were awarded first Prize in the Oral presentation entitled "Extraction of Sericin from cocoon and silk waste" in the International Conference on Global Scenario and Sustainable solutions inSilk industry held at Bharat Tex Expo on February 28, 2024.
3. Gifty Saini and Ahmed Bilal, B.Sc. (H) Zoology, I Year were awarded first Prize in the Oral presentation entitled "Cultivating cordyceps by usings silkworm as a substrate" in the International Conference on Global Scenario and Sustainable solutions inSilk industry held at Bharat Tex Expo on February 28, 2024.

# Appendix VII
# Interdisciplinary Projects

## Interdisciplinary Projects under DBT STAR College Scheme

The grant received by DBT has helped in enhancing scientific exposure of undergraduate students via participation in various interdisciplinary projects/ routine lab work conducted under DBT-STAR college scheme.

| S. No | Title of the Project | Mentor/s | Name of the Student/s | Course & Semester |
|---|---|---|---|---|
| **1.** | Sunlight Sensitive Smart Roof with Rainfall Protection | Prof. Anju Agrawal | Aman | B.Sc. (H) Electronics, II Year |
| | | Dr.Ravneet Kaur | Muskankumar Sharma | |
| | | Dr. Monika Bhattacharya | Vishal Gupta | |
| **2.** | Fourier transform applications in image processing | Dr. Monika Bhattacharya | Prachi Dubey | B.Sc. (H) Electronics, II Year |
| **3.** | GSM based Home Security Alarm System | Dr. Monika Bhattacharya | Vishal Gupta | B.Sc. (H) Electronics, II Year |
| | | Ms. GauriGhai | Chandan Kumar | |
| | | | Prashant Kumar | |
| | | | Sachin Jarwal | |
| **4.** | A comparative study of Esports and Traditional sports: Analysis of Audience and Revenue Generation | Dr. Monika Bhattacharya | Harsh Singh | B.Sc. (H) Electronics, I Year |
| | | Prof. Anju Agrawal | Tanmay Sharma | |
| | | | Vansh | |
| **5.** | Departmental Website ELE.DEP | Dr. Ravneet Kaur<br>Ms. Gauri Ghai | Govind Kushwah<br>Abhinav Saxena<br>Pankaj Kumar | B.Sc. (H) Electronics, I Year |
| **6.** | An 8-bit computer on breadboard using only logic gates in the form of integrated circuits. | Dr. Ravneet Kaur<br>Dr. Monika Bhattacharya<br>Prof. Anju Agrawal | Naman Beri<br>Abdul Hannan Mallik<br>Mirza Mohammad Ain Ali<br>Manish Yadav<br>Dilsher | B.Sc.(H) Electronics, I Year |
| **7.** | A self-balancing robot using arduino uno | Dr. Ravneet Kaur<br>Dr. Monika Bhattacharya<br>Prof. Anju Agrawal | Deepak Kumar Jha<br>Dilsher<br>Mayank Kumar | B.Sc.(H) Electronics, I Year |
| **8.** | Facial recognition attendance system (AI/ML) | Dr. Ravneet Kaur<br>Dr. Monika Bhattacharya<br>Prof. Anju Agrawal | Sudhanshu Kumar<br>Prateek Sheokand<br>Nikhil Kumar<br>Anuj Purohit<br>Priya Ranjan | B.Sc.(H) Electronics, I Year |
| **9.** | Little Move- Safe | Dr. Ravneet Kaur | Harsh Kumar | B.Sc. (H) |

| | | | | |
|---|---|---|---|---|
| | Transportation Solution | | | Electronics, II Year |
| **10.** | To study interactions of SARS COV-2's surface and secretory proteins with amyloidogenic proteins responsible for cardiac amyloidosis | Dr. Archna Pandey<br>Dr. Rimpy Kaur Chowhan | Hirday Sehgal<br>Ajay Kumar Singh | B.Sc. (H) Biomedical Science, III Year |
| **11.** | Prevalence of hypertension in college going youths | Dr. Sunita Jetly | Riya Rajput<br>Alarmelumangai Anushka | B.Sc. (H) Biomedical Science, II Year |
| **12.** | Detection of chronic myeloid leukemia in patients through novel techniques | Dr. Sunita Jetly<br>Dr. Ritu Khosla | Jassi Goyal | B.Sc. (H) Biomedical Science, II Year |
| **13.** | To assess the impact of thalassemia through awareness and screening among college youth and assess the role of genetic counseling | Dr. Sunita Jetly<br>Dr. Deepshikha | Srishti | B.Sc. (H) Biomedical Science, II Year |
| **14.** | Extraction of Phytochemicals from such as flavonoids and alkaloids and Characterization of their Antioxidant and Anti-Inflammatory Properties through in-vitro assays. | Dr Ritu Khosla<br>Dr Archna Pandey | Khushi Bhatt<br>Arpita Singh | B.Sc. (H) Biomedical Science, II Year |
| **15.** | Study of Rise in Shingles cases as an aftermath of Covid 19 | Dr. Ritu Khosla<br>Dr. Archna Pandey | Anshika Bansal | B.Sc. (H) Biomedical Science, II Year |
| **16.** | Synthesis of silver nanoparticles using environment friendly chemicals | Dr. Ritu Khosla<br>Dr. Archna Pandey<br>Dr. Rajeev Ranjan | Najjam | B.Sc. (H) Biomedical Science, II Year |
| **17.** | To synthesize silver nanoparticles and study their stability characteristics. | Dr. Ritu Khosla<br>Dr. Archna Pandey<br>Dr. Rajeev Ranjan | Ritu Papney | B.Sc. (H) Biomedical Science, II Year |
| **18.** | Synthesis and stabilization studies of | Dr. Ritu Khosla<br>Dr. Archna Pandey | Vipasha Kamboj | B.Sc. (H) Biomedical |

| | | | | |
|---|---|---|---|---|
| | silver nanoparticles | Dr. Rajeev Ranjan | | Science, II Year |
| **19.** | Enhancement of antibiotic efficacy through synergistic effect using multifarious medicinal plant extracts to curb *E. coli* growth | Dr. Satendra Singh Department of Biomedical Science Dr. Anita Narang Dr. Sumit Sahni | Hirtik Singh Rathore Saarthak Kumar SuprobhAhna Borah | B.Sc. (H) Biomedical Science, II Year |
| **20.** | Exploring the Antimicrobial Properties of *Musca domestica* as a Natural Alternative to Antibiotics in the Fight Against Antibiotic Resistance | Dr. Seema Makhija Dr. Ravi Toteja | Abdullah | B.Sc. (H) Biomedical Science, II Year |
| **21.** | Analyzing the antibacterial effect of $TiO_2$ nanoparticles synthesized from Aloe Vera | Prof. Charu Gupta | Jasman Singh | B.Sc. (H) Biomedical Science, II Year |
| **22.** | Study of laboulbeniomycetes | Dr. Anupama Shukla | Maushami P T | B.Sc. (H) Biomedical Science, II Year |
| **23.** | India's Startup Ecosystem: A case study on Book With UVA | Mr. Sanjay Vohra Convenor Entrepreneurship Lab | Prince | B.Sc. (H) Biomedical Science, II Year |
| **24.** | Genome and transcriptome data Analysis for novel target identification and Characterization | Dr. Rimpy Kaur Chowhan Dr. Archna Pandey | Hariom Chaudhary | B.Sc. (H) Biomedical Science, I Year |
| **25.** | Reactive Oxidation Species (ROS) determination in leaves of different plant species: Exploring the relationship with air pollution | Prof. Charu Khosla Gupta Dr. Anita Thakur | Nikita Singh Dhankhar Tanisha Singh | B.Sc. (H) Biomedical Science, I Year |
| **26.** | Characterization of plant extracts as bio-indicators of pollution levels | Prof. Charu Khosla Gupta Dr. Anita Thakur Prof. Arijit Chowdhuri | Niharika Sehgal<br><br>Surabhi Dixit | B.Sc. (H) Biomedical Science, I Year<br>B.Sc. (Prog) Life Science, |

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| **27.** | Use of $Fe_2O_3$ nanoparticles derived from laboratory waste as catalyst | Prof. Seema Gupta<br>Prof.Gagan Dhawan | Dipankar Dev Rishi | B.Sc. (H) Chemistry, II Year |
| **28.** | Conversion of lab-waste into useful $Fe_2O_3$ nanoparticles for water purification as well as catalyst-a greener approach | Prof. Seema Gupta<br>Prof.Gagan Dhawan | Bhumika Bhardwaj | B.Sc. (H) Chemistry, II Year |
| **29.** | Synthesis of $Cu_2O$-$Cu(OH)_2$ nanoparticles from the lab waste for catalytic activity | Prof. Seema Gupta<br>Prof. Gagan Dhawan | Nibha Kumari | B.Sc. (H) Chemistry, II Year |
| **30.** | Green synthesis of metal oxide nanopartic les and their use as bioenzymes | Prof. Seema Gupta<br>Dr. Satendra Singh | Anuj Thakur | B.Sc. (H) Chemistry, II Year |
| **31.** | Application of metal oxide nanoparticles prepared from plant extracts as bioenzymes | Prof. Seema Gupta<br>Dr. Satendra Singh | Divya | B.Sc. (H) Chemistry, II Year |
| **32.** | Enhancement Of Antibiotic (Kanamycin) Efficacy Through Synergistic Effect Using Multifarious Medicinal Plant Extracts To Curb Micrococcus luteus. | Dr. Satendra Singh<br>Dr. Anita Narang<br>Dr. Sumit Sahni | Saarthak | B.Sc. (H) Biomedical Science, II Year |
| **33.** | Obstacle Avoidance Robotic Vehicle | Dr. Monika Bhattacharya<br>Dr. Ravneet Kaur | Dev Panchal<br>Anshu Kumari<br>Saurabh Kaushik<br>Prachi Dubey | B.Sc. (H) Electronics, II Year |
| **34.** | Phish Detect: A Machine Learning-based Phishing Detection Tool | Ms. Gunjan Rani | Amartya Sinha<br>Nilesh Pandey | B.Sc. (H) Computer Sc. III Year |
| **35.** | Faculty Publication Management | Prof. Sharanjit Kaur | Shahnwaz Khan<br>Prakash Kumar Singh | B.Sc. (H) Computer Sc. III Year |
| **36.** | Future Implications of Language Models on Common People's Daily Life | Mr. Mahesh Kumar | Ajay Yadav<br>Ankit<br>Vinay Pratap Singh | B.Sc. (H) Computer Sc. II Year |

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| **37.** | D2C selling portal for farmer produce based on nearest traversal of demands | Dr. Preeti Marwaha | Arpit Bhardwaj | B.Sc. (H) Computer Sc. II Year |
| **38.** | Digital Empowerment of students of Acharya Narendra Dev College | Dr. Sunita Narang<br>Dr. Shallu Mahajan | Awani Sharma<br>Ayush Bhardwaj<br>Yuvraj Saroha<br>Utkarsh Tiwari | B.Sc. (H) Computer Sc. II Year |
| **39.** | WanderLust | Ms. Gunjan Rani<br>Prof. Sharanjit Kaur | Ayush Yadav<br>Pranav Singh<br>Shrishti Rawat<br>Riyansh Sharma | B.Sc. (H) Computer Sc. II Year |
| **40.** | Translating Court Judgments into regional languages | Ms. Gunjan Rani<br>Dr. Mahesh Kumar | Chandan Kumar<br>Shorya Bhatnagar<br>Shubh Sankhyadhar | B.Sc. (H) Computer Sc. II Year |
| **41.** | Free Online Repository for Various Stages in Crop Production | Ms. Nishu Singh | Dinesh Kumar<br>Mihir Kumar Sah | B.Sc. (H) Computer Sc. II Year |
| **42.** | D2C:Portal for selling agricultural produce using greedy algorithm | Dr. Preeti Marwah | K. Kanak Megha | B.Sc. (H) Computer Sc. II Year |
| **43.** | Impact of AI Models | Dr. Mahesh Kumar | Priyam Tripathi | B.Sc. (H) Computer Sc. II Year |
| **44.** | Digital Empowerment of students of Acharya Narendra Dev College | Dr. Sunita Narang | Yuvraj Saroha | B.Sc. (H) Maths, II Year |
| | | | Ayush Bhardwaj | B.Sc. (H) Comp.Sc, II Year |
| | | Dr. Shallu Mahajan | Awani Sharma | B.Sc. (H) Comp.Sc., II Year |
| | | | Utkarsh Tiwari | B.Sc. (H) Maths, II Year |
| **45.** | Synthesis of Coordination compounds of Novel heterocyclic compounds of biological importance. | Dr. Manisha Jain and Prof. Pankaj Khanna | Abhay Patel, Anushka Yadav & Ajit, | B.Sc. Life Science II Year |

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| **46.** | To synthesize and characterize metallic nanoparticles using deep eutectic solvent and their applications to treat the contaminated water. | Prof. Seema Gupta and Prof. Pooja Bhagat | Gounshi Kumar, Rohit kumar Barnwa | B.Sc. (H.) Chemistry I Year |
| **47.** | Study of modified Graphene for Adsorption of Metal Ions. | Prof. Geetu Gambhir and Prof. Sunita Hooda | Ananya Singh, Mukesh Kumar | B.Sc. (H.) Chemistry I Year |
| **48.** | To investigate the use of green methods for experiments and organic synthesis at undergraduate level. | Prof. Rashmi Thukral | Shashank Devanand | B.Sc.(H) Chemistry II Year |
| **49.** | Corrosion study of Aluminium and Iron metal with Graphene nano powder. | Prof. Neelu Dheer | Pintu Kumar, Aryan, Shivam | B.Sc.(H) Chemistry I Year |
| **50.** | Computational studies on the kinetics and mechanisms of some organic reactions. | Dr. Neeti Misra | Hridya Warrier, Nidhi Singh and Rishika | B.Sc (H) Chemistry II Year |
| **51.** | Mitigation of Amoxicillin by adsorption on novel magnetic functionalized cellulose blended rGO. | Prof. Sunita Hooda, Prof. Geetu Gambhir and Dr. Manisha Verma | Anirudh Karnam, Shalini | B.Sc. Life Science, II Year |
| **52.** | To synthesize and characterize metallic oxide nanoparticles for bi-functionalization of enzymes. | Prof. Pooja Bhagat and Prof. Seema Gupta. | Madhur Agrawal | B.Sc.(H) Biomedical Science, II Year |
| **53.** | NO donor tethered metal complexes as efficacious antimicrobial agents. | Dr. Vikrant Kumar. | Sunny Kumar | B. Sc. (H) Chemistry I Year |
| **54.** | An efficient and environmentally sustainable domino protocol for the synthesis of annulated benzothiazoloquinazolines derivatives involving three-component reaction. | Prof. Dinesh Kumar Arya. | Kumari Nyasa and Mahak Singh | B.Sc. Chemistry (Hons) II Year |

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| **55.** | Adsorption of Metformin Hydrochloride Drug by Chitosan-Based Graphene Oxide (GO) Nanocomposites | Prof. Sunita Hooda and Prof. Geetu Gambhir | Kapil Sharma, Puneet Chauhan, Soven Kumar Samal | B.Sc. Life Science III Year |
| **56.** | Study of Hybrid Magnetic Spinels for Photocatalysis | Prof. Sunita Hooda, Prof.Geetu Gambhir and Dr. Bhawna Kaushik | Srashti Gupta, Zubishah Rais | B.Sc. Life Science III Year |
| **57.** | Nano composites of Magnetic Tamarind with Cobalt Oxide as a promising Adsorbent for Reactive Blue19 Dye from Wastewater | Prof. Sunita Hooda, Prof. Geetu Gambhir and Dr. Manisha Verma | Illma Khan and Aayushi Rajput | B.Sc. Life Science III Year |
| **58.** | To Study of the Role of Nyquist Plot and Graphical Analysis of Electrochemical Impedance Spectroscopic Data | Dr. Sanjeeta Rani, Dr. Manisha Verma and Prof. Sunita Hooda | Kunwar Sugam Anugrah, Abhineet Singh Rajput | B.Sc. (Hons.) Physics I Year |
| **59.** | Study of allelopathic effects of weeds on seed Germination of *Vignaradiata L.* | Dr. Rashmi Sharma | Vishal Bahadur B.K. | B.Sc. (H) Botany, II Year |
| | | | Sahil Kumar | |
| **60.** | Studying Sociological Impact of Madness and Maternity in Select literary works | Ms. Ankita Rasaily | Parthib Kalita DevikaA.P Pratikshya Panda Ankisha Choudhary AnushkaTomar | B.Sc.(H) Zoology, I Year |
| **61.** | Screening of bioactive compounds from Streptomyces spp. against pathogenic fungi | Dr Monisha Khanna Kapur | Dhruv Bhasin Anshika Sharma Abhay Gupta | B.Sc (H) Zoology, III Year |

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| **62.** | Green synthesis of silver nanoparticles ($AgNO_3$) from Streptomyces spp. and antifungal of nanoparticles upon pathogenic fungi | Prof. Monisha Khanna Kapur | Kapil Sharma | B.Sc Life Science, III Year |
| **63.** | Investigating the biochemical response of Lead (Pb) toxicity in *Euplotes woodruffi* | Prof. Seema Makhija & Prof. Ravi Toteja | Anshika<br>Ankur | B.Sc Life Science II Year<br>B.Sc. (Hons.) Zoology II Year |
| **64.** | Utilizing Ciliates as Bioindicators: Unveiling Environmental Health | Prof. Seema Makhija and Prof. Ravi Toteja | Vasundhra<br>Nandini Gupta | B.Sc Life Science II Year<br>B.Sc (Hons.) Zoology II Year |
| **65.** | To Study the Effects of Ethanol Exposure on different Developmental Stages of Zebrafish | Dr. Monica Misra<br>Ms. Bhumika | Bhawna Gurnani<br>Aru Chaudhary<br><br>Jasmine Negi<br>Tannu Gond | B.Sc Life Science II Year<br>B.Sc (Hons.) Zoology III Year |
| **66.** | To investigate the effects of different diets on the growth and development of Zebrafish | Dr Monica Misra<br>Ms. Bhumika | Shikha Negi<br><br>Mvathsal | B.Sc Life Science II Year |
| **67.** | Establishment of the Culture and observe their growth 120 hours post-fertilization | Dr. Monica Misra<br>Ms. Bhumika | Divya Pandey<br>Anshika Tyagi<br><br>Vasundhra Bhattacharya | B.Sc Life Science III Year<br><br>B.Sc Life Science II Year |
| **68.** | Formulation of a pyrethroid-laced ATSB effective against dengue vector | Prof. Sarita Kumar | Sakshi Singh, Shriti Kumari, Arti, Aaryan Mani, Vishwanath, Risha, Seemal, Khushi, Pulkit, Prasurjya, Siya, | B.Sc. (H) Zoology, I Year |

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| | | | Kshitij, Anupama, Suryam, Manvi<br><br>Aniruddh, Hitesh | B.Sc. Life Sciences, II Year |
| **69.** | Effects of pyrethroid on the physiological and biochemical parameters of dengue vector. | Prof. Sarita Kumar | Rishabh, Muskan Yadav, Niharika, Gifty, Harsh, Himank, Manthan, Mohit, Arnav, Divyanshu, Pratham, Punita, Saloni, Shilpa, Shubhashish, Yashashvi, Tanisha | B.Sc. (H) Zoology, I Year |

# Appendix VIII
## New Experiments Introduced

**Biomedical Science: (33)**

| S. No. | New Experiments Introduced |
|---|---|
| 1 | Qualitative tests for Amino acids and Proteins: Ninhydrin, Xanthoproteic, Million's, Lead Acetate, Biuret test |
| 2 | Qualitative test for Fats |
| 3 | To study the titration curve of glycine |
| 4 | Estimation of a Reducing sugar in a given sample |
| 5 | Analysis of sodium hypochlorite content in various household products |
| 6 | To detect primary alcohol in sample/ household products |
| 7 | To detect aromatic amines in the sample/ household products |
| 8 | To study various toxic substances in terms of exposure, health effects, from various online resources (such as https://www.atsdr.cdc.gov/ , TOXNET or other sources) |
| 9 | Isolation and purification of pure bacteria: streaking for single colonies |
| 10 | Propagation of pure bacteria in liquid culture |
| 11 | Field visit to a clinical microbiology lab/diagnostic lab to familiarize with latest tools and techniques used in microbial research |
| 12 | Phytochemical screening of Curcuma longa by solvent extraction: Terpenes and polyphenols |
| 13 | Represent different types of data in tables and graphs (Line chart, histogram, bar chart, frequency polygon, pie chart) using any spreadsheet software like MS EXCEL |
| 14 | Calculate various measures of central tendency (Arithmetic mean, mode, median and partition values) and dispersion (Range, standard deviation, coefficient of variance and covariance) using any spreadsheet software like MS EXCEL |
| 15 | Calculate probabilities for different distributions- normal and binomial using any spreadsheet software like MS EXCEL |
| 16 | Prepare scatter plot between two variables and interpret the relationship between them using correlation and simple linear regression analysis using any spreadsheet software like MS EXCEL. |
| 17 | Perform large sample test for single mean and difference of means using any spreadsheet software like MS EXCEL |
| 18 | Perform Student's t-test for one sample, independent samples, and paired samples using any spreadsheet software like MS EXCEL |
| 19 | Perform Chi-square test using any spreadsheet software like MS EXCEL |
| 20 | Perform One-way ANOVA using any spreadsheet software like MS EXCEL |
| 21 | Perform Two-way ANOVA using any spreadsheet software like MS EXCEL |
| 22 | Perform Non-parametric analysis: The Sign test or The Wilcoxon signed-rank test using any spreadsheet software like MS EXCEL |
| 23 | To explore any publically available database for tuberculosis/typhoid and study its epidemiology in the Indian population |
| 24 | To study the epidemiology of malaria including geographical and seasonal distributions in India through a public database |

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| 25 | To study various parameters like risk factors, incidence, prevalence, mortality rate and DALYs. for any specific type of cancer prevalent in India through NCRP or any other public database |
| 26 | To study the burden and causes of any hematological disorder in the Indian population. |
| 27 | To explore and analyze various national and international disease databases like ICMR/WHO/CDC/ etc. |
| 28 | To prepare a questionnaire for any health conditions. |
| 29 | To prepare a poster/ presentation using any digital media to communicate about the epidemiology and to create awareness about any health conditions |
| 30 | Measurement of absorbance & % transmittance of a solution using spectrophotometer/colorimeter |
| 31 | Estimation of glucose concentration by an enzymatic/non-enzymatic method |
| 32 | Determination of Km, Vmax and Kcat value of a given enzyme from the provided experimental data |
| 33 | Study of diploidy in onion root tip |

**Botany: (19)**

| S. No. | New Experiments Introduced |
|---|---|
| **1** | Isolation of soluble proteins from sprouts and its separation through polyacrylamide gel electrophoresis. |
| **2** | Lignin degrading enzyme isolation from the spent mushroom substrate |
| **3** | How to develop Virtual labs for various experiments conducted in the curriculum |
| **4** | Determination of BOD, COD, TDS and TOC of different water samples |
| **5** | Determination of coliforms in water samples using eosin methylene blue (EMB) medium |
| **6** | Hydrolysis of casein by microorganisms |
| **7** | Hydrolysis of starch by microorganisms |
| **8** | Column Chromatography of chlorophyll |
| **9** | Use of various softwares like MS Excel, SPSS, R-Stat, and SigmaPlot. |
| **10** | Calculate the percentage similarity between different cultivars of a species using RAPD profile. Construct a dendrogram and interpret results |
| **11** | Estimation of organic matter content in soil samples |
| **12** | Stage of pollen dehiscence using flurochromes |
| **13** | Preparation of mushroom spawn |
| **14** | Techniques for the cultivation of Agaricus, Pleurotus and Ganoderma |
| **15** | Structure download (protein and DNA) from PDB (Textual file format- PDB and mmCIF) |
| **16** | Molecular viewer by visualization software (Ras Mol/ J mol/Swiss 3D Viewer/Pymol) |
| **17** | Translate a nucleotide sequence and select the correct reading frame of the polypeptidefrom the output sequences (such as, Translate tool of Expasy |
| **18** | Predict the structure of protein from its amino acid sequence. (Phyre 2/ Modweb/ CPHmodel/ Swiss Model) |
| **19** | Gene prediction using GENSCAN and GLIMMER. |

**Chemistry: (26)**

| S. No. | New Experiments Introduced |
|---|---|
| 1 | Introduction of Basics of Molecular Modelling, Avogadro Software & Argus Lab Software |
| 2 | Optimization of solvent system for the separation of components in Thin Layer Chromatography |
| 3 | Determination of cell constant |
| 4 | To study the kinetics of Iodide-persulphate reaction by Initial rate method |
| 5 | Study the variation of co-efficient of viscosity with different concentration of Poly Vinyl Alcohol (PVA) and determine molar mass of PVA |
| 6 | Write a program in BASIC to calculate the values using following equations:<br>Ideal gas equation<br>Van der Waals equation |
| 7 | Write a program in BASIC to solve simultaneous equations. |
| 8 | Write a program in BASIC to plot the graph of a particle in 1-D box. |
| 9 | Effect of temperature on the action of salivary amylase. |
| 10 | Estimation of glycine by Sorenson's formalin method. |
| 11 | Acetylation of one of the following compounds: amines (aniline, o-, m-, p- toluidines and o-, m-, p-anisidine) and phenols (β -naphthol, vanillin, salicylic acid) by using conventional method. |
| 12 | Acetylation of oneof the following compounds: amines (aniline, o-, m-, p- toluidines and o-, m-, p-anisidine) and phenols (β -naphthol, vanillin, salicylic acid) by using green approach. |
| 13 | To synthesize Ag nanoparticles and characterize by SPR peak. |
| 14 | To verify the Charle's law of a gas. |
| 15 | To Study the effect of various parameters on the adsorption of metal ions by Atomic Adsorption Spectroscopy. |
| 16 | Write a program in BASIC to solve quadratic equations $ax^2 + bx + c = 0$ with known values of a, b and c |
| 17 | Synthesis of ammine complexes of Ni(II) and its ligand exchange reactions (e.g. bidentate ligands like acetylacetone, DMG, glycine) by substitution |
| 18 | To study Properties of Complexes<br>Measurement of 10 Dq by spectrophotometric method<br>Verification of spectrochemical series.method. verify spectrochemical series by recording UV spectra. |
| 19 | To perform Claisen schmidt reaction using the green method. |
| 20 | To find out melting point of the given organic compound without using paraffin oil/acid bath. |
| 21 | To find out boiling point of the given organic compound without using paraffin oil/acid bath. |
| 22 | To study the effect of different types of acids on iodination of aldehydes. |
| 23 | To study the molecular weight of different synthetic polymers by Viscometry. |
| 24 | To study potentiometric analysis of different redox reactions. |
| 25 | To study the effect of different parameters on corrosion of mild steel. |
| 26 | Distribution of acetic/ benzoic acid between water and chloroform or cyclohexane |

## Computer Science: (44)

| S. No. | Experiment |
|---|---|
| **1.** | PCA-normal notebook (uploaded in code folder) using fetch_lfw_people data. |
| **2.** | Use iris data to do the following:<br>i) Standardise the data<br>ii) Apply PCA to get first component only and plot first component wrt zerovector (along y-axis with range -2 to 2) and visualize using colors of class label.<br>iii) Reapply PCA for two components. Display range of these twocomponents. plot the components and see the difference compared to part (1) display variance of first components (of part 3) and find out its ratio w.r.t. total variance. |
| **3.** | Exploring different time zones through python libraries. |
| **4.** | Arithmetic operation in time series data: Periods and Period Arithmetic |
| **5.** | Create a Data Frame with NA values |
| **6** | Create a Data Frame of Cars and Colors and use the map function to add a third column mentioning the companies of the cars. |
| **7** | Create subplots of dimensions 3X2 using both methods.<br>i) Plot lines on all of them of 50 random numbers.<br>ii) Keep the same x and y-axis.<br>iii) The first row lines should be red.<br>iv) The second-row lines should be blue.<br>v) The third-row lines should be green.<br>vi) All the lines are to be dashed.<br>vii) Put asterisk as marker on all lines. |
| **8** | Create a series with 3 values at indexes 2, 4, and 7.<br>i) Reindex the series as '0', '1', …. '9'.<br>ii) Backward fill the Null values with limit 2.<br>iii) Fill the null values in series from part a with 'Missing'.<br>iv) Drop all the values in series from part c which are not 'Missing'.<br>v) Create a data frame of values from 0 to 12 with 3 rows and 4 columns. |
| **9** | a. Name the index and columns.<br>b. Create a series of even values of length 5 and add that series into the data frame<br>a. Columns wise<br>b. Row wise<br>c. Reindex either columns or rows to fill the missing values in both 1 and 2 with 0.<br>d. Sort the values of the data frame from section 1 in descending order. |
| **10** | Consider the series s1 = 8, -3, -4, 3, -4, 8, 2, 1, 2, 0<br>i) Rank the series with tie-breaker method as Min.<br>ii) Rank the series with tie-breaker method as First. |
| **11** | Create a series with all the names of colors in Rainbow:<br>i) Change the index values as multiples of 3.<br>ii) Display the names of colors with an index value of more than 12.<br>iii) Change the index values to "Violet", "indigo", ……, "Black", and "White".<br>iv) Check if there is any Null value in the series now.<br>v) Assign the index name colors to the NaN values. |

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| **12** | Create a series from some Data Dictionary in Python. |
| **13** | Create a data frame of 10 students in your class having their Names, IDs, and Contact Numbers.<br>i) Add a new column University ID to the data frame.<br>ii) Delete the ID from the data frame.<br>iii) Give the row names as one, two three…..<br>iv) Find the values in the third row of the column 'Name'.<br>v) Print all the Contact details of students.<br>vi) Add another column semester marks.<br>vii) Add another column 'Result' where write 'pass' if semester marks are above 40 out of 100 else write 'fail'. |
| **14** | Consider the following data dictionaries.<br>{'a': 12, 'b': 45, 'd': 79, 'b': 13, 'a': 43, 'e': 33}<br>{'b': 23, 'd':90, 'f': 55, 'a': 21, 's': 26, 'd': 78}<br>Now performed the following operations:<br>i) Make series out of those two data dictionaries.<br>ii) Append the two series by index.<br>iii) Find the Union of series one and series two.<br>iv) Find the difference between series one from two.<br>v) Compute the set intersection of the two series.<br>vi) Delete index 4 from both series. |
| **15** | Implement Gradient Descent algorithm in the following manner: (Give it a try)<br>i) First take a dataset with single independent variable and find the best fit using Simple Linear Regression.<br>ii) Using the values of coefficients given in step a, apply gradient descent to minimize loss function and then make prediction again.<br>iii) Compare the best fit line of case a and b. |
| **16** | Use the KNN and Naive Bayes Classifier to classify the Emails into Spam or not Spam. Also, evaluate the accuracy of both the Models. |
| **17** | Perform splitting of dataset into Dependent and Independent variables after identifying them. |
| **18.** | Download any Dataset from ML UCI repository and apply all Pre-processing Tools for:<br>i) Handling Missing Data<br>ii) Encoding Independent and Dependent Variables<br>iii) Splitting the Dataset into the Training and Test Set<br>iv) Feature Scaling |
| **19** | Perform the classification of Email spam or not using Decision Tree Classifier. |
| **20** | Take a dataset where features do not have a linear relationship. Implement Linear Regression on it. Also, implement Ridge Regression on it and compare the results. |
| **21** | Logistic Regression Classification. |
| **22** | Decision Tree Classification. |
| **23** | Design a web page with three sections: Menu, Content, and Footer(do not consider the positioning). In the Menu section put 2 things: A link to home page and a link to contact page. In content section: write a program to ask user to give value of n and print the table of n with proper variable representation. Also provide the sample output for this program. All the keywords used in program should be highlighted as yellow. In footer section put few |

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| | things: date, course name, semester, college, student name, and teacher name. All the content of footer should be aligned to right. |
| **24** | Write JavaScript to validate the form created by student in HTML practical. |
| **25** | Write JavaScript to show the usage of setInterval function using which background colour of a division keeps on changing to a random colour. |
| **26** | Implement Breadth First Search Algorithm using python. |
| | Implement Depth First Search Algorithm. |
| **27** | Implement A* search algorithm. |
| **28** | Create an application for Temperature and Currency converter. |
| **29** | Create an application to send username from one intent to another. (Explicit Intent Demo). |
| **30** | Create an application with an activity having EditText and a button. On clicking of button, make use of implicit intent that uses a Dial Action and let user make a call. |
| **31** | Create an application for Temperature and Currency converter. |
| **32** | Create Models using Deterministic Finite Automata. |
| **33** | Simulation of OS Process Life Cycle. |
| **34** | Simulation of Order Lifecycle on your Favorite App. |
| **35** | Simulation of Reservation of a Flight Simulation of a Fully Automatic Washing Machine. |
| **36** | Simulation of Booking Vaccine on COWIN App. |
| **37** | Simulation of Your favorite video game (eg Mario upto 1 level only). |
| **38** | Simulation of Your favorite Music App (Spotify, Gaana). |
| **39** | Simulation of College Library System : Simulation of Ordering from an Automated Canteen/Restaurant. |
| **40** | Simulation of Amazon Delivery (assume order is booked). |
| **41** | Simulation of Uber/Ola Cab booking. |
| **42** | Simulation of various functions of a MicroWave Oven. |
| **43** | Simulation of Automatic Gears in an automatic Car. |
| **44** | Simulation of TCP connection establishment |

**Electronics: (37)**

| S. No. | New Experiments Introduced |
|---|---|
| 1. | Measurement of Inductance by Anderson's bridge. |
| 2. | Characteristics of one Solid State sensor/ Fiber optic sensor |
| 3. | To determine the characteristics of resistance transducer - Strain Gauge. |
| 4. | Design a R-2R DAC. |
| 5. | Design a non-sequential counter using D/T/JK Flip flop. |
| 6. | Design an ADC circuit using ADC0804. |
| 7. | Study of Colpitt's Oscillator |
| 8. | Visualization of Spreadsheet Models. |
| 9. | Visualization of Semi-Structured Data. |
| 10. | Interactive Plots in Python and Tableau |
| 11. | Hierarchical and Topographical Data Visualizations in Tableau. |
| 12. | Calendar Heatmaps and Flow Data Visualizations in Python. |
| 13. | Time Series Data Visualization in Plotly. |
| 14. | Creating cloud account Amazon/Azure/Google/IBM to store images /files / programs |

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| 15. | Use a dataset that contains immigration details e.g. Canada for a given duration of 30 years (Canada Immigration Dataset, source: https://open.canada.ca) or any other<br>a. Create an area plot for top 6 immigrant countries in a given duration.<br>b. Create and year-wise immigrant bar chart from India to Canada in a given duration.<br>c. Create a boxplot of immigrants for three given countries.<br>d. Show the total no. of immigrants using Area Chart and Pie chart for two given countries.<br>e. Create a scatter Histogram for the immigrants in the given year for two specific countries |
| 16. | Build a simple quiz app in flutter for android, ios, and web. |
| 17. | Build a cross-platform app based on your own idea. |
| 18. | Program to calculate area of circle, rectangle and square |
| 19. | Program to print Fibonacci series |
| 20. | Program to print Pascal triangle |
| 21. | Program to evaluate HCF(GCD) of two numbers |
| 22. | Program to evaluate LCM of two numbers |
| 23. | Program to illustrate use of various inbuilt library functions in 'math' and 'statsmodel' python library |
| 24. | Program to count the number of vowels in a given string |
| 25. | Program to remove all duplicate values in a given list |
| 26. | Program to count positive and negative numbers in a list. Create two new lists: (i) having only negative numbers and (ii) having only positive numbers |
| 27. | Program to find sun of elements in a list |
| 28. | Program to read a list of 'n' integers. Create two new lists: (i) having only negative numbers and (ii) having only positive numbers |
| 29. | Program to create a list of tuples from the given list having number and it's cube in each tuple |
| 30. | Program to create a dictionary which maintains record of the following student information: Admission Number, Roll Number, Name and Marks, Display information of a particular student on the basis of Admission Number |
| 31. | Program which contains user defined functions as a 'module' to calculate area, perimeter/surface area and volume of various shapes like square, cube, circle, cylinder etc. |
| 32. | Menu driven program to implement a simple calculator (i) which is capable of performing basic arithmetic operations (addition, subtraction, multiplication, division etc.) , (ii) for evaluation of other useful functions such as log10(x), sin(x), cos(x) etc. |
| 33. | Basic Data Analysis using PANDAS python library |
| 34. | Data Representation using Vectors and Matrices using NUMPY Library |
| 35. | Data Munging, Data Aggregation and Grouping Operations using PANDAS, MATPLOTLIB and SEABORN library |
| 36. | Analysis of Time-dependent data to predict Future Trends from Past Values (STATS MODEL- PYTHON LIBRARY) |
| 37. | PROJECT: Create an AWS account and implement AWS cloud for deploying any application |

**Physics: (29)**

| S.No. | New Experiments Introduced |
|---|---|
| 1 | Measurement of dielectric constant of metal using Surface Plasmon resonance (SPR) technique |
| 2 | Determination of refractive index of a dielectric layer using SPR technique. |
| 3 | Measurement of P - E hysteresis and plotting its characteristics |
| 4 | Systematic determination of wavelength of LASER by studying the diffraction pattern produced by a plane diffraction grating having different grating constants |
| 5 | To determine the wavelength of LASER source using diffraction of single slit. |
| 6 | To determine the wavelength of LASER source using diffraction of double slits. |
| 7 | To determine angular spread of He-Ne LASER using plane diffraction grating |
| 8 | To find the polarization angle of LASER light |
| 9 | Studying the characteristics of Light Dependent Resistor (LDR) |
| 10 | Studying the characteristics of MOSFET |
| 11 | Studying the characteristics of DIAC |
| 12 | Studying the characteristics of TRIAC |
| 13 | Recording & reconstructing LASER viewable holograms |
| 14 | Study of Pulse Amplitude Modulation |
| 15 | Recording & Reconstructing single-step rainbow holograms |
| 16 | Study of Pulse Position Modulation |
| 17 | Study of Pulse Width Modulation |
| 18 | Study of Amplitude Shift Keying (ASK) Modulation and demodulation |
| 19 | Study of Frequency Shift Keying (FSK) Modulation and demodulation |
| 20 | Study of Phase Shift Keying (PSK) Modulation and demodulation |
| 21 | Generation and analysis of Time Division Multiplexing (TDM) waveforms |
| 22 | Study of characteristics of Junction Field Effect Transistors |
| 23 | Study of characteristics of Unijunction Transistors |
| 24 | Study of Hartley Oscillators |
| 25 | Study of Colpitt Oscillators |
| 26 | Study of Flipflops (SR, D, JK, JK Master-Slave) |
| 27 | Study of Shift Registers (SISO, SIPO, PISO and PIPO configurations) |
| 28 | Study of Counters (Asynchronous and Synchronous configurations) |
| 29 | Experimenting with Arduino microcontrollers |

**Zoology: (42)**

| S.No. | New Experiments Introduced |
|---|---|
| 1 | Phylogenetic analysis using bioinformatic tools. |
| 2 | DNA isolation from bacterial culture. |
| 3 | Agarose gel electrophoresis. |
| 4 | Culturing and observation of ciliates/bacteria. |
| 5 | Polymerase chain reaction (PCR) using 18S rRNA primers. |
| 6 | Isolation of environmental DNA from soil samples. |
| 7 | Determination of zooplankton diversity in freshwater samples. |
| 8 | Virtual experiment on antibiotic resistance/sensitivity in the curd bacteria. |

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| **9** | Comic video on antibiotic resistance. |
| **10** | DNA extraction from human cheek cells and tomato: Virtual experiment. |
| **11** | DNA extraction from banana: Virtual experiment. |
| **12** | DNA extraction from onion: Virtual experiment. |
| **13** | Virtual experiment on antibiotic resistance/sensitivity in the curd bacteria. |
| **14** | Comic video on antibiotic resistance. |
| **15** | DNA extraction from human cheek cells and tomato: Virtual experiment. |
| **16** | DNA extraction from banana: Virtual experiment. |
| **17** | DNA extraction from onion: Virtual experiment. |
| **18** | Study of growth kinetics of Gram –ve bacteria using homemade spectrophotometer: Virtual experiment. |
| **19** | Effect of different concentrations of antibiotics on bacteria using potato slices as media: Virtual experiment. |
| **20** | Preparation of culture media: Virtual experiment. |
| **21** | Gelatin gel electrophoresis: Virtual experiment. |
| **22** | Plasmid DNA isolation: Virtual experiment. |
| **23** | Determination of effect of temperature on the activity of the enzyme lipase: Virtual experiment. |
| **24** | Preparation of buffer solutions of different pH. |
| **25** | Predicting the structure of protein using on line softwares. |
| **26** | Separation of component from a mixture of red and blue ink by paper chromatography: Virtual experiment. |
| **27** | Study the effect of temperature on the activity of salivary amylase: Virtual experiment. |
| **28** | Qualitative analysis of oils and fats. |
| **29** | Estimation of vitamin c or ascorbic acid. |
| **30** | Determination of pH and temperature in a pond ecosystem. |
| **31** | To determine the pH of different water sample: Virtual experiment. |
| **32** | Determination of the intensity of light penetration using a secchi disc in different water samples: Virtual experiment. |
| **33** | Comparing alkalinity of different water samples from different sources by using red cabbage as pH indicator. |
| **34** | Determination of population density, frequency and abundance in a hypothetical community (alphabets on a newspaper) by quadrat method and calculation of Shannon-Weiner diversity index for the same community. |
| **35** | Determination of the pH of different soil sample. |
| **36** | Study plankton diversity in pond water by using fold scope. |
| **37** | Study of pond water collected from different places to observe diversity in Protista using videos. |
| **38** | Study of soil samples collected from different places to observe diversity in nematodes using videos. |
| **39** | Pedigree analysis of human inherited traits using data. |
| **40** | Study and verification of Hardy-weinberg law by Chi-square analysis. |
| **41** | Study of the principle & method involved in counting of total leucocytes from blood (Life Science-3rd Semester). |
| **42** | Study of the principle, method and physiological significance of estimating bilirubin. |

# Appendix IX
## Publications (April 2023- March 2024)

| S. No. | Publications |
|---|---|
| **Biomedical Science** | |
| 1 | Das R, Arora R, Nadar K, Saroj S, Singh AK, Patil SA, Raman SK, Misra A, **Bajpai U**. (2024). Insights into the genomic features and lifestyle of B1 subcluster mycobacteriophages. J Basic Microbiol. 2024 Mar 28:e202400027. DOI: 10.1002/jobm.202400027. |
| 2 | Shah, S., Das, R., Chavan, B., **Bajpai, U**., Hanif, S, Ahmad, S (2023). Beyond antibiotics: Phage-encoded lysins against Gram-negative pathogens. Front. Microbiol., Volume 14-2023 |
| 3 | Arora, R., Nadar, K., **Bajpai, U**. (2024). A novel LysinB from an F2 sub-cluster mycobacteriophage RitSun. BioRxiv. https://doi.org/10.1101/2024.02.29.582697. |
| 4 | Arora, R., Das, R., Nadar, K., & **Bajpai, U.** (2024). Genome announcement and analysis of five new mycobacteriophages belonging to the F, G, K, and P clusters. BioRxiv, https://doi.org/10.1101/2024.02.15.580488. |
| 5 | Das, R., Nadar, K., Arora, R., & **Bajpai, U**. (2024). Unlocking prophage potential: In silico and experimental analysis of a novel Mycobacterium fortuitum LysinB containing a peptidoglycan-binding domain. BioRxiv, https://doi.org/10.1101/2024.02.15.580446. |
| 6 | Hanif, S., Das, R., Chavan, B., Shah, S., **Bajpai, U.,**& Ahmed, S. (2023). Phage-encoded lysins as promising antibacterials against uropathogenic *Escherichia coli*. JAC-Antimicrobial Resistance, 5, dlac133-014. Conference proceeding. |
| 7 | Wang, Q, Bian, Y, **Dhawan**, G, Zhang, W, Sorochinsky, A.E., Makarem.A, et al. (2024) FDA approved fluorine-containing drugs in 2023. Chinese Chemical Letters, 2024, 109780 |
| 8 | Singh, I, **Dhawan**, **G**, Gautam, HK, Kumar, P (2023) Monosaccharide-mediated nanosilver particles: Synthesis, characterization, biological evaluation and dye degradation potential. Trends in Carbohydrate Research, 15 (3), 1-14. |
| 9 | Agarwal, N.; Khanna, M.; **Dhawan, G.** (2023) Identification of suitable house-keeping genes during chikungunya virus infection, Indian Journal of Medical Microbiology, 42, 49–52. https://doi.org/10.1016/j.ijmmb.2023.01.007 |
| 10 | Wang, N.; Mei, H.; **Dhawan, G.**; Zhang, W.; Han, J.; Soloshonok, V. A. (2023) New Approved Drugs Appearing in the Pharmaceutical Market in 2022 Featuring Fragments of Tailor-Made Amino Acids and Fluorine, Molecules, 28, 3651. https://doi.org/10.3390/molecules28093651 |
| 11 | Kumar, S., Choudhary, N., Faruq, M., Kumar, A., Saran, R.K., Indercanti, P.K., Singh, V., Sait,H., **Jetly, S**., Valis,M.,Kuca,M.,Polipalli,S.K., Kumar,M.,Singh, T., Suravajhala, P., Sharma, R., & Kapoor, S. (2023). Anastrozole-mediated modulation of mitochondrial activity by inhibition of mitochondrial permeability transition pore opening: an initial perspective. *Journal of biomolecular structure & dynamics*, 1–17. Advance online publication. https://doi.org/10.1080/07391102.2023.2176927. |
| 12 | **Rajesh Chaudhary** & S. Madan (2024). Sighting of Large Branded Swift Pelopidas sinensis (Mabille, 1877) (Hesperiidae: Hesperiinae) in Delhi, India. Journal of Threatened |

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| | Taxa 16(3): 25013–25015. https://doi.org/10.11609/jott.8715.16.3.25013-25015 |
| 13 | **Rajesh Chaudhary**, & Shantanu Dey (2023): *Volkameriainermis*, a new larval host plant of Common Shot SilverlineSpindasisictis (Lepidoptera: Lycaenidae) in India. J. Bombay Nat. Hist. Soc. 120(2). doi: 10.17087/jbnhs/2023/v120/165944. |
| 14 | **Rajesh Chaudhary,** M.Sharma, S. Chhimwal and V. Kumar (2023). New additions to the checklist of Butterflies of Corbett Tiger Reserve, Uttarakhand, India. Bionotes, vol 25 (1-2): 69-74. |
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| 16 | **Rajesh Chaudhary** (2023) Sighting of Common Cerulean Jamides celeno (Cramer, [1775]) (Insecta: Lepidoptera: Lycaenidae) in Aravallis of Haryana bordering Delhi, India. Bionotes, 25 (3): 22-23. |
| 17 | Sachdeva, N.; Goomer. S.; Singh, L. R.; Pathak, V. M.; Aggarwal, D.; **Chowhan, R. K.** (2023) Current status of millet seed proteins and its applications: A comprehensive review. Applied Food Research, 3, 100288. https://doi.org/10.1016/j.afres.2023.100288 |
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| 19 | Morozova, E.P., Smolyarova T.E., Lukyanenko K.A., Kirillova M.A., Volochaev M.N., Kichkailo A.S., **Ranjan R.**, & Kratasyuk V.A. (2023). Metal-enhanced bioluminescenceby detergent stabilized Ag and Au nanoparticles. Talanta 254: 124157. https://doi.org/10.1016/j.talanta.2022.124157 |
| **Botany** | |
| 1 | Arijit Chowdhuri and **Charu Khosla Gupta** 2023 Gauging the Assessment of Some Anthropogenic Factors Driving Climate- Change. Current World Environment Vol. 18, No. (2) 614-636 |
| 2 | Nitin Joshi, **Charu Khosla Gupta**, Yash Mangla and Arijit Chowdhuri 2023 Green Plants as a Sustainable Solution to Air Pollution. International Journal of Plant and Environment. 9(2), 102-112. |
| 3 | **Gupta, C.K.** (2023). Modified Ovule Clearing Technique to Examine Monosporic Apinagia-type Embryo sac Development in *Indotristicharamosissima*(Podostemaceae-Tristichoideae). International Journal of Plant and Environment. 9(4), 378-381. |
| 4 | **Anita Narang**, **Anupama Shukla**, Surinder Kaur. 2023. Developmental Studies of Indian Laboulbeniales - Dimeromycesanisolabis (Ascomycota, Laboulbeniomycetes). KAVAKA 59(2): 85-91 (2023) DOI: 10.36460/Kavaka/59/2/2023/85-91 |
| 5 | **Anupama Shukla, Anita Narang**, Surinder Kaur. 2023. Effect of Adenine Sulphate on In Vitro Micropropagation of Acacia holosericea A. Journal of Tropical Life Science 13 (3): 497 – 502. doi: 10.11594/jtls.13.03.08. Cunn. ex G. Don Leaflets and Leaf Rachis Explants |
| 6 | **Anita Narang**, Surinder Kaur, **Anupama Shukla**. 2024. Seasonal variation in contamination and browning of Acacia nilotica nodal explants in vitro. Journal of Applied and Natural Science, 16(1), 102 - 109. https://doi.org/10.31018/jans.v16i1.5303 |
| 7 | Ratandeep, Akshat Bhanu Dharmani, Manisha Verma, Sanjeeta Rani, **Anita Narang**, M. Ramananda Singh, Laishram Saya, Sunita Hooda. 2024. Unravelling groundwater contamination and health-related implications in semi-arid and cold regions of India. |

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| | Journal of Contaminant Hydrology 261: 1-22 https://doi.org/10.1016/j.jconhyd.2024.104303 |
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| 2 | Saxena R, **Kaur S**, **Ahuja H**, **Narang S**. Leveraging item attribute popularity for group recommendation. International Journal of System Assurance Engineering and Management. 2024 Mar 17:1-1. |
| 3 | Kochhar SK, Sharma A, Jain D, Rani G, **Gaur V**. A Blended Approach to Analyze Indian Stock Market during COVID-19. International Journal of Computing and Digital Systems. 2023 May 5;14(1):1-. |
| 4 | Soni A, Jain S, Karki M, **Gaur V**, Kochhar SK. Topic Modelling, Classification and Characterization of Critical Information. International Journal of Computing and Digital Systems. 2023 May 2;14(1):1-. |
| 5 | Kochhar S.K., Karki M., Jain S., Rani G., **Gaur V**. Quantifying and leveraging emotions to fight a pandemic. International Journal of Advanced Technology and Engineering. 2023. |
| 6 | Saxena R, **Narang S, Ahuja H**. Improving the Effectiveness of E-learning Videos by leveraging Eye-gaze Data. Engineering, Technology & Applied Science Research. 2023 Dec 5;13(6):12354-9. |
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| **Chemistry** | |
| 1 | Drashya Gautam, Roopa Rani Samal, Sarita Kumar**, Sunita Hooda** and **Neelu Dheer**, One pot chemical co-precipitation preparation of magnetic graphene oxide-deltamethrinnanoformulations for management of *Aedes aegypti,* Journal ofApplied and Natural Science**,** 15 (1), 194 -203, 2023**.** ISSN : 0974-9411 (Print), 2231-5209 (Online).**DOI**https://doi.org/10.31018/jans.v15i1.4305. |
| 2 | Manisha Verma, Drashya Gautam, Ravina Yadav, **Vikrant Kumar**, **Sunita Hooda**, and **Neelu Dheer,** Role of Functionalized CHITIN-EDTA Aa a Promising Adsorbent For Water Purification**,** Rasayan, J. Chem**.,** 16 (2),| 660 - 666, 2023. ISSN: 0974-1496 \| e-ISSN: 0976-0083, I.F.-1.3, http://doi.org/10.31788/RJC.2023.1628289.. |
| 3 | Manisha Verma, Amit Kumar, Shyam Lal, Deepika Khandelwal, Praveen Kumar Tomar, **Neelu Dheer, Sunita Hooda,** Mamta Bhatia**, Shallu Sachdeva**, Vandana Kumari, Ni2+ ion sensitive sustainable sensors based on 4-vinyl pyridine-ethyl acrylate copolymer, Applied Chemical Engineering (2023), 6(1),38-45, ISSN2576-3954, I.F-0.20,http://dx.doi.org/10.24294/ace.v6i1.1948. |
| 4 | Puneeta Sarin, Manisha Verma**,** Sanjeeta Rani**, Geetu Gambhir** and **Sunita Hooda**, Controlled radical polymerization And Characterization Of Vinylic- Acrylate Copolymer, European Chemical Bulletin**,** 12 (4),666-679, 2023, 2063-5346 , ISSN: 2063-5346 , I. F.-0.34, http://dx.doi.org/10.31838/ecb/2023.12.4.054 |
| 5 | Sanjeeta Rani, **Sunita Hooda, Neelu Dheer,** V Bhasker Raj, Ishwar Prasad Sahu, |

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| | Manisha Verma, Complex dielectric-impedance spectroscopic studies of magnetite added chitin biopolymer, Applied Chemical Engineering (2023), 6 (1), 59-67, ISSN2576-3954, I. F. 0.20http://dx.doi.org/10.24294/ace.v6i1.1965. |
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| 7 | Deepika Khandelwal, **Vikrant Kumar**, **Neeti Misra, Shallu Sachdeva,** Sanjeeta Rani, Manisha Verma**,** Ishwar Prasad Sahu, **Sunita Hooda,** NMR spectroscopy based configurational and compositional analysis of isobornyl methacrylate- Acrylonitrile copolymers**,** Applied Chemical Engineering (2023), 6(1), 82-93, ISSN2576-3954, 0.20,http://dx.doi.org/10.24294/ace.v6i1.1999. |
| 8 | **Shallu Sachdeva, Neelu Dheer**, **Sunita Hooda**, **Neeti Misra**, Bipasa Arya, Manisha Verma, Sangeeta Kaul, Chemistry in biosystem - A contemporary review of Schiff bases and their metal complexes as antioxidants and anti-fungal agents, Applied Chemical Engineering (2023), 6(1), 68-81, ISSN2576-3954, 0.20,http://dx.doi:10.24294/ace.v6i1.1943. |
| 9 | **Sunita Hooda,** Sanjeeta Rani, V. Bhasker Raj, Arijit Chowdhuri, Drashya Gautam and Manisha Verma, Effect of Ferrite Nanomaterials on the Thermal Stability of Biopolymer and Graphene oxide Blend**,** *Rasayan J. Chem.*, 16(3), 1495-1502 (2023) http://doi.org/10.31788/RJC.2023.1638445**.** |
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| 11 | Sanjeeta Rani, Syed Kashif Ali, Pawan Kumar, Kunwar Sugam Anugrah, Laishram Saya, **Geetu Gambhir**, Drashya Gautam, **Sunita Hooda**, Manisha Verma, Novel multicomponent functionalized biopolymers with enhanced thermal and dielectric properties, Polimery, 68, nr 7- 8, 386-395 (2023). |
| 12 | Sanjeeta Rani, **Bhawna Kaushik**, Laishram Saya, **Sunita Hooda** and Manisha Verma, Structural, electrical and dielectric properties of $ZnFe_2O_4/Cu_2S$ 3D heterostructures, Material Research Express, 10, 105011 (1-15), (2023), https://doi.org/10.1088/2053-1591/ad04b |
| 13 | Laishram Saya, W. Rameshwor Singh a, **Sunita Hooda**, Design and performance assessment of novel Fe3O4 decorated nanoblend of guar gum/graphene oxide flakes and CuO for mitigation of fluoroquinolones from wastewater, J. Water Process, Engg., 57, (2024), 104577, http://doi.org/10.1016/j.jwpe.2023.104577. |
| 14 | Ratandeep, Akshat Bhanu Dharmani, Manisha Verma, Sanjeeta Rani, Anita Narang, M. Ramananda Singh, Laishram Saya, **Sunita Hooda**. Unravelling groundwater contamination and health-related implications in semi-arid and cold regions of India, Journal of Contaminant Hydrology, 261, (2024) 104303, http://doi.org/10.1016/j.jconhyd.2024.104303. |
| 15 | Laishram Saya, Ratandeep, Bipasa Arya, Kanjika Rastogi, Manisha Verma, Sanjeeta Rani, Prasanta Kumar Sahu, M. Ramananda Singh, W. Rameshwor Singh, **Sunita Hooda**, |

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| | Recent advances in sensing toxic nerve agents through DMMP model simulant using diverse nanomaterials-based chemical sensors. Talanta 272 (2024) 125785, https://doi.org/10.1016/j.talanta.2024.125785. |
| 16 | Madhur Babu Singh, **Pooja Bhagat**, Pallavi Jain, Prashant Singh (2023) Exploration of DFT and TD-DFT computation to investigate the interaction between paracetamol and lithium or its compounds. Journal of Molecular Liquids, 383, 122114 |
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| 2 | Rana, A., Bhatnagar, S., Garg, S. and **Garg, A**. (2023) Wide frequency range optical chopper system: an affordable solution using 3D printing and Arduino Uno. *Physics Education*. 38(6). |
| 3 | Roy, K., Garg, S., Rana, A., Tomar, S. and **Garg, A**. (2023) An Innovative Approach to Measuring Spring Constants: Utilizing 3D Printing and Sound Sensing with Improved Time Resolution in Data Collection. Accepted for publication in Physics Education Journal, Indi |
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| 6 | Chugh, N., Kumar, M., **Bhattacharya, M**., & Gupta, R. S. (2023) Potential and Electric Field Analysis of Field Plated AlGaN/GaN HEMT for High Voltage Applications using 2D-Analytical Approach. *Microelectronics Journal*, 138, pp 1-9 |
| **Physics** | |
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| 5 | Ratandeep, Dharmani A.B., **Verma M., Rani S.,** Narang A., Singh M.R., Saya L., Hooda S. (2024), Unravelling groundwater contamination and health-related implications in semi-arid and cold regions of India –261 DOI: 10.1016/j.jconhyd.2024.104303, Journal of Contaminant Hydrology |
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| 8 | Verma N., **Joshi R.** (2023), Shannon entropy for hydrogen atom in Debye and quantum plasma environment –6, 30, DOI: 10.1063/5.0146178, Physics of Plasmas |
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| 15 | Miglani R., Gupta R., Sharma A., Tomar M., **Chowdhuri A.** (2023), $Ba_{1-x}Sr_xTiO_3$ thin-film-based X – band selective coplanar waveguide microwave resonator using SiO2 as buffer layer – 16 38 4009 DOI: 10.1557/s43578-023-01118-2, Journal of Materials |

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| 16 | **Joshi R.** (2023), Shannon entropy for endohedrally confined hydrogen atom embedded in Debye plasma 8 138 DOI: 10.1140/epjp/s13360-023-04400-8, European Physical Journal Plus |
| 17 | **Rani S.**, Kaushik B., Saya L., Hooda S., **Verma M.** (2023), Structural, electrical and dielectric properties of ZnFe2O4/Cu2S 3D heterostructures –10 10 DOI: 10.1088/2053-1591/ad04bfMaterials Research Express |
| 18 | **Joshi R.** (2023) Fine structure calculations, polarizability and oscillator strengths for C VI ion embedded in Debye plasma applying accurate Numerov method, 5 56 273 DOI: 10.1080/00387010.2023.2206906, Spectroscopy Letters |
| 19 | **Joshi R.**, Verma N., Mohan M. (2023), Shannon entropy along hydrogen isoelectronic sequence using numerov method –6 69 DOI: 10.31349/RevMexFis.69.060401,Revista Mexicana de Fisica |
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| **Zoology** | |
| 1 | Dagar, V.S., Mishra, M., Sharma, A., Sankar, M. & **Kumar, S.** (2023). Alterations in the gut enzymes of *Helicoverpa armigera* induced by dietary stress of *Artemisia annua* essential oil. *International Journal of Tropical Insect Science,* https://doi.org/10.1007/s42690-023-01035-1 |
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| 3 | Falswal, J., Dey, D. & **Kumar, S.** (2023). First record of Lipotriches (Rhopalomelissa)burmicafrom India along with a checklist of species from India (Hymenoptera: Halictidae: Nomiinae). FragmentaEntomologica, 55(2): 171-176. https://doi.org/10.13133/2284-4880/1447 |
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| 13 | Jeeva Susan Abraham, Sripoorna Somasundaram, Swati Maurya, Renu Gupta, **Ravi Toteja, Seema Makhija** (2024). A study on spatio-temporal variations in physicochemical parameters and ciliate community structure of three freshwater bodies from Delhi, India. Limnology, https://doi.org/10.1007/s10201-024-00747-8. |
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| 15 | Thakur, M.; **Bhardwaj, S.;** Singh, J.; Senrung, A.; Singh, J. (2023) Three Years of Covid-19 – A Review on India's Journey through Different Variants and Waves, International Journal for Research Trends and Innovation, 8(1), 26-35. |

## Book Chapters and Books

| S. No. | Details |
|---|---|
| 1 | Aggarwal, S.; Mahajan, P.; Gupta, P.; Yadav, A. ; **Dhawan, G.;** Dhawan, U.; Yadav, A. K.; (2023) The bacterial communication system and its interference as an antivirulence Strategy, In Bacterial Survival in the Hostile Environment, Ed. Kumar, A.; Tenguria, S. Academic Press, pg 163-191. ISBN : 978-0-323-91806-0. https://doi.org/10.1016/B978-0-323-91806-0.00010-2 |
| 2 | Sunita Jetly; Satendra Singh; Archna Pandey; Shruti Banswal; Manisha Khatri (2023). Human Adult T-Cell Leukemia Virus Type 1 (HTLV1). Emerging Human Viral Diseases, Volume-II, Springer (In Press) |
| 3 | Rajesh Chaudhary and Vinesh Kumar (2023). Wildlife in and around Corbett Tiger Reserve. Niyogi Books Pvt. Ltd. . ISBN: 978-8196405366 |
| 4 | Gaur, V., Sinha A and Kaur R. (2023). An intelligent Covid management system for pre schools In: Mishra, A., Gupta, D., Chetty, G. (eds) Advances in IoT and Security with Computational Intelligence. ICAISA 2023. Lecture Notes in Networks and Systems, vol 755. Springer, Singapore. https://doi.org/10.1007/978-981-99-5085-0_25. |
| 5 | Jha, A., Gaire,P., Kaur, R. and Bhattacharya, M. (2023) IoT Based Smart Drainage System: Mishra, A., Gupta, D., Chetty, G. (eds) Advances in IoT and Security with Computational Intelligence. ICAISA 2023. Lecture Notes in Networks and Systems, vol 755. Springer, Singapore. https://doi.org/10.1007/978-981-99-5085-0_23. |
| 6 | Prof. Sarita Kumar Chapters - In: Parasitology, M.Sc. Zoology Course Material, IGNOU, New Delhi<br>➢ *Plasmodium* species - https://egyankosh.ac.in/handle/123456789/102042<br>➢ *Leishmania*species - https://egyankosh.ac.in/handle/123456789/102043<br>➢ Parasites of Lymphatic System- https://egyankosh.ac.in/handle/123456789/102054<br>➢ Ectoparasites of Animals - https://egyankosh.ac.in/handle/123456789/102060 |

## Book Editor

- Academic Editor of '***Journal of Parasitology Research'***, Hindawi Publications, Wiley Inc.
- Academic Editor of '***Insecticides in Pest Control - Impact, Challenges and Strategies'***, IntechOpen, London, UK by Prof Sarita Kumar.
- **Editor, Parasitology**, M.Sc. Zoology Course Material, IGNOU, New Delhi Prof Sarita Kumar.

## Papers in Conference Proceedings

| S. No. | Details |
|---|---|
| 1 | Jain, K., Bhatnagar, V., **Kaur, S.** (2023). Collective Behavior in Community-Structured Network and Epidemic Dynamics. In: Jain, S., Groppe, S., Mihindukulasooriya, N. (eds) Proceedings of the International Health Informatics Conference. Lecture Notes in Electrical Engineering, vol 990. Springer, Singapore. https://doi.org/10.1007/978-981-19-9090-8_16 |
| 2 | Sharma, A.; **Goel, N.;** (2023) Effect of MSD viscosity and Coriolis force on Soret driven ferrothermohaline convection in an anisotropic darcy porous medium with LTNE: Linear stability analysis, Proceedings of 2nd international conference on Mathematics in space and applied sciences, pg 85-92, Vol. 1, ISBN-978-81-947143-1-6. |
| 3 | Sharma, A.; **Goel, N.;** (2023) Study of lack of thermal equilibrium and anisotropic effects on double-diffusive ferroconvection in porous medium, Proceedings of 2nd international conference on Mathematics in space and applied sciences, , pg 242-246, Vol. 1, ISBN-978-81-947143-1-6. |
| 4 | Vashishtha, S., Yogi, D.K., Singh, S. K., **Kaur, R.** & Agrawal, A. (April, 2023). IoT Based Landslide Detection System", Ravneet Kaur and Anju Agrawal, In 2023 International Conference On "Interdisciplinary Research in Technology & Management" (IRTM-2023) (pp.-377-380) Deen Dayal Upadhyaya College, University of Delhi, New Delhi, India. University of Canberra, Australia and NIT Arunachal Pradesh, India. |
| 5 | Hanif, S., Das, R., Chavan, B., Shah, S., **Bajpai, U.,** & Ahmed, S. (February, 2023). Phage-encoded lysins as promising antibacterials against uropathogenic *Escherichia coli*. *JAC-Antimicrobial Resistance*, Volume *5*, Issue Supplement_1 |

## Conference Presenentation

1. Sankar, M. & **Kumar, S.** (2023) Comparative influence of the diflubenzuron on the adult emergence and detoxification enzymes expression in the laboratory-bred and field-collected strains of *Aedes aegypti* L. (Diptera: Culicidae). In: 16th International Conference of Medical Arthropodology (ICMA-2023) on *"Emerging and Re-emerging Infectious Vector-borne and Zoonotic Diseases: Impact of Climate Change and Global Warming"* VBZ-16, pp: 46.
2. Jyoti Dagar, Swati Maurya, Sripoorna Somasundaram, Jeeva Susan Abraham, Sandeep Antil, **Pooja Bhagat**, **Ravi Toteja**, and **Seema Makhija** "Bacteria-ciliates' symbiosis: An ancient partnership" in Second South Asian Symposium on Microbial Ecology (SASME 2023) held on 1st – 3rd Nov, 2023 in Dhulikhel, Nepal.
3. Swati Maurya, Jyoti Dagar, Jeeva Susan Abraham, Sripoorna Somasundaram, Sandeep Antil, **Seema Makhija**, **Ravi Toteja, Pooja Bhagat**, Utkarsh Sood and Rup Lal. "Deciphering the eukaryotic microbial diversity through metagenomic approach" in Second South Asian Symposium on Microbial Ecology (SASME 2023) held on 1st – 3rd Nov, 2023 in Dhulikhel, Nepal.
4. Swati Maurya, Sripoorna Somasundaram, Sandeep Antil, Jyoti Dagar, Jeeva Susan Abraham, **Ravi Toteja**, **Seema Makhija**, Utkarsh Sood and Rup Lal. "Colpoda n. sp. : A Cosmoplitan Eukaryotic Microbe Isolated from Sewage Treatment Plant of Jasola, Delhi, India: Journey from Classical Taxonomy to Macrogenome Analysis" in Second South Asian Symposium on Microbial Ecology (SASME 2023) held on 1st – 3rd Nov, 2023 in Dhulikhel, Nepal.
5. Sripoorna Somasundaram, Jeeva Susan Abraham, Swati Maurya, **Seema Makhija** and **Ravi Toteja**. "Defining Heavy Metal Toxicity, Detoxification Mechanisms, and Metalloproteins in Freshwater Ciliates: Insights from Cellular, Molecular and Computational Aspects" in Second

South Asian Symposium on Microbial Ecology (SASME 2023) held on 1st – 3rd Nov, 2023 in Dhulikhel, Nepal.

6. Sandeep Antil, Sripoorna Somasundaram, Jeeva Susan Abraham, Swati Maurya, Jyoti Dagar, **Seema Makhija**, **Pooja Bhagat, Ravi Toteja** "Assessment of Lead (Pb) Toxicity in Two Different Isolates of Euplotes woodruffi by Morphological, Biochemical, and Molecular Mechanisms" in Second South Asian Symposium on Microbial Ecology (SASME 2023) held on 1st – 3rd Nov, 2023 in Dhulikhel, Nepal.
7. Effect of habitat restoration on reproductive fitness of Cassia fistula_ L.- an ecologically important native tree in Delhi NCR& quot;- Aniket Raj, Vaibhav Khatri, Srijal Priya, Arijit Chowdhuri, **Charu Khosla Gupta** and **Vineet K. Singh**, International Conference on Chemical and Biological Sciences (ICCBS 2024), 27-29 January 2024, organized by Atma Ram Sanatan Dharma College (University of Delhi) Dhaula Kuan, New Delhi – 110 021, INDIA pp 158
8. Adiya Vatsa, Roja Sharma, Mitali Saini, **Charu Khosla Gupta, Vineet Kumar Singh**, "Impacts of heavy metals on plants and the efficacy of phytohormones in their mitigation: exploration of sustainability and food security"- International Conference on Chemical and Biological Sciences (ICCBS 2024), 27-29 January 2024, organized by Atma Ram Sanatan Dharma College (University of Delhi) Dhaula Kuan, New Delhi – 110 021, INDIA pp 183
9. Pooja Devi, Nitin Joshi, **Anita Thakur**, **Geetika Kalra**, **Arijit Chowdhuri, Charu Khosla Gupta** Effect of environmental pollution in modulating levels of reactive oxygen species in some native trees of Delhi" International Conference on Chemical and Biological Sciences (ICCBS 2024), 27-29 January 2024, organized by Atma Ram Sanatan Dharma College (University of Delhi) Dhaula Kuan, New Delhi – 110 021, INDIA pp 119.
10. Oral Presentation: Titled *Green Synthesis of Copper Nanocomposites from Lab Waste: A Sustainable Approach for Environmental and Antibacterial Applications* at International Conference on Chemical and Biological Sciences - 2024 (ICCBS-24), held online from January 27th to January 29th, 2024.

# Appendix X
# Training Received by Faculty

## Biomedical Science: (10)

1. Dr Archna Pandey and Dr Rimpy Kaur Chowhan from Department of Biomedical Science attended International Conference on "Antimicrobial Resistance, Novel Drug Discovery and Vaccine Development: Challenges and Opportunities", organised by SRM University at India Habitat Centre, New Delhi. March 18-20, 2024
2. Dr Rimpy Kaur Chowhan from Department of Biomedical Science attended Professional Development Programme on "National Education Policy 2020: Professional Development Programme", organised by IGNOU Staff Training and Research Institute of Distance Education. November 1-20, 2024
3. Dr Rimpy Kaur Chowhan from Department of Biomedical Science attended Webinar on "Protein Dynamics: the key to Biological Function", organised by Protein Society. October 07, 2023
4. Dr Archna Pandey and Dr Rimpy Kaur Chowhan from Department of Biomedical Science attended AWS public sector symposium New Delhi, organised by Amazon Web Services. September 22, 2023
5. Dr Satendra Singh from Department of Biomedical Science attended Faculty Development/Training Programme on "Sericulture: Rearing And Its Application", organised by Acharya Narendra Dev College, Shaheed Rajguru College of Applied Science for Women, Shri Guru Tegh Bahadur Khalsa College, Skill Enhancement Course Committee, University of Delhi. August 8-14, 2023
6. Dr Rimpy Kaur Chowhan from Department of Biomedical Science attended workshop on "Evidencing benefits of probiotics on gut-brain axis in aging & neuro-degeneration", organised by All India Institute of Medical Science (AIIMS). July 20-21, 2023
7. Dr Archna Pandey and Dr Rimpy Kaur Chowhan from Department of Biomedical Science attended Conference on "Navigating Education in a Globalised World", organised by Elets Technomedia, Elets World Education Summit. July 4-5, 2023

## Botany: (04)

1. Dr. Geetika Kalra attended Faculty development program at CCS, HAU Hisaron Hydroponics and Aeroponics Farming from 4 to 10 September 2023.
2. Dr. Sumit Sahni attended Faculty development program at CCS, HAU Hisaron Hydroponics and Aeroponics Farming from 4 to 10 September 2023.
3. Dr. Mandeep Kaur attended Faculty development program at CCS, HAU Hisaron Hydroponics and Aeroponics Farming from 4 to 10 September 2023.
4. Dr. Mandeep Kaur attended Faculty development program at CCS, HAU Hisaron Organic Farming and Biofertilizers from 7 to 12 August 2023.

## Chemistry: (09)

1. Dr. Kavita Mittal Participated in One day Hands On Workshop on Forensics Science, organized by the Department of Biomedical Science, Acharya Narendra Dev College,
2. University of Delhi on April 12, 2023, under the aegis of IQAC and DBT STAR College Scheme.
3. Prof.Sunita Hooda, successfully participated in INDO-UK Webinar entitled "Future of Teaching-Learning and Assessment in Higher Education"jointly organized by Guru Angad Dev

Teaching Learning Centre, SGTB Khalsa College,University of Delhi under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching(PMMMNMTT) of Ministry of Education and NPTC Group of Colleges, Wales, United Kingdom held on01st September 2023.

4. Prof.Sunita Hooda, has participated in the One Week National level Online Faculty Development Program on Outcome Based Education and Application of Generative AI in Teaching and Research,organised by the DST-CURIE-AI center of Sri PadmavatiMahilaVisvavidyalayam (SPMVV University), Tirupati, in association with ipsr solutions limited from 18 March 2024 to 23 March 2024.
5. Prof. Sunita Hooda and Prof.GeetuGambhir, have participated in INDO-UK Webinar entitled "Future of Teaching-Learning and Assessment in Higher Education" jointly organized by Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College,University of Delhi under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education and NPTC Group of Colleges, Wales, United Kingdom held on 01st September 2023.
6. Prof. Seema Gupta attended Twelve Principles of Green Chemistry and UN-SDGs, being organized by Green Chemistry Network Centre, Hindu College, University of Delhi at the Research Centre, Hindu College, University of Delhi on 9-10 November 2023.
7. Prof. Seema Gupta participated & deliberated upon establishing the guidelines for Continuous Assessment for the courses under the Theme "Chemistry" in a Two-day workshop on Establishment Of Modalities for Skill Enhancement Courses organised by Skill Enhancement Course Committee, University of Delhi, on 4-5th March, 2024 in Conference Centre, University of Delhi.
8. Prof. Seema Gupta attended attended National Conference on One earth • One family • One future organized by department of commerce, acharya Narendra Dev College, University of Delhi, Delhi School of Economics, University of Delhi in collaboration with Indian Commerce Association (ICA), Delhi NCR Chapter on April 03, 2023.

**Computer Science: (01)**

1. Prof. Sharanjit Kaur attended Faculty Development Programme (FDP) ON Natural Language Processing and LLMs (28th February 2024 to 9th March 2024) Organized by Electronics & ICT Academy, National Institute of Technology, Warangal

**Electronics: (07)**

1. Dr. Ravneet Kaur attended the Symposium on TREnds in Aptitude for Skill Development in Undergraduate Research (TREASURE) organized by on September 20, 2023 organized by Science Foundation Committee, Star DBT College Program, The National Academy of Sciences India - Delhi Chapter and Deen Dayal Upadhyaya College (University of Delhi) on September 20,2023.
2. Dr. Ravneet Kaur attended 8th International Conference of Indian Network for Soil Contamination Research (INSCR-2024) on 'Exploring the Microbial World from Human Health to Environmental Sustainability' and 4th International Symposium on Ciliate Biology (ISCB-2024), organised by INSCR and Acharya Narendra Dev College, University of Delhi (UoD) from April 03-05, 2024 at Conference Centre, UoD, Delhi, India.
3. Dr. Ravneet Kaur attended "Advancements in Antenna Development: Current Trends and Challenges" organised by Department of Electronic Science, University of Delhi South

Campus, New Delhi, India in Collaboration with IEEE APS & CRFID Delhi Chapter held on 29th Jan, 5th Feb & 7th Feb 2024 in the hybrid mode.

4. Prof. Anju Agrawal attended "Advancements in Antenna Development: Current Trends and Challenges" organised by Department of Electronic Science, University of Delhi South Campus, New Delhi, India in Collaboration with IEEE APS & CRFID Delhi Chapter held on 29th Jan, 5th Feb & 7th Feb 2024 in the hybrid mode.
5. Dr. Ravneet Kaur attended a series of Workshops on "Evolution of Transistor and Emerging Research Devices" as part of the Celebration of 75 Years of Invention of the Transistor organized by IEEE Electron Device Society - Delhi Chapter (New Delhi, India), The National Academy of Sciences India - Delhi Chapter and Deen Dayal Upadhyaya College (University of Delhi).
6. Dr. Ravneet Kaur attended Workshop on Electrical (DC, AC, and transient analysis) and thermal characterization of Advanced CMOS, SOI, and FinFET
7. Dr. Ravneet Kaur attended Workshop on Technical Lecture in Workshop on Electrical and thermal characterization of HEMT

**Physics: (06)**

1. Dr. V. Bhasker Raj and Prof. Arijit Chowdhuri were Resource Persons and held other positions at Hands-on training Workshop on Semiconductor Device Fabrication organized by Miranda House, University of Delhi, in collaboration with CIIDRET, UDSC and DSSEED, University of Delhi. The workshop was organized from 20 March – 3 April 2023 under the aegis of 100 days Skill Festival of University of Delhi.
2. Dr. Ranjeeet Singh completed one week long FDP on Blended Learning – Concepts and Tools from TLC, Ramanujan College under the aegis of DoE, PMMMNMTT initiative. The FDP was held from 01 – 07 July 2023.
3. Dr. Ranjeet Singh presented a paper titled 'Non-local regime of Relativisitic Weibel Instability in the presence of a LASER pump in Plasma' at the 3rd International Conference on Plasma Theory and Simulations (PTS 2023) organized from 21 – 23 September 2023 at Jawahar Lala Nehru University, New Delhi.
4. Dr. V. Bhasker Raj completed One-Week National Faculty Development Program from 17 – 23 July 2023 organized by University of Delhi (Skill Enhancement Course Committee) in collaboration with Daulat Ram College, DU (Department of Physics) and Guru Angad Dev Teaching Learning Centre, a Centre under PMMMNMTT, Ministry of Education, Government of India.
5. Mr. Pawan Kumar completed two week interdisciplinary Refresher Course on Research Methodology and Data Analysis" from 28th July – 10th August, 2023 from TLC, Ramanujan College under the aegis of DoE, PMMMNMTT initiative.

**Zoology: (12)**

1. Dr Vineet Girdharwal, Dr Shrankhla and Ms. Bhumika Chauhan attended Skill Development for sustainable Aqauculture organized by Department of Zoology, University of Delhi from June 19-25, 2023.
2. Mr Ravinder Kumar Sagar, Dr Neelgagan Singh, Dr Rahul Dev, Mr Vineet Girdharwal and Dr Shrankhla attended One-week National Faculty Development Programme(FDP) *Sericulture: Rearing and Its Application"* organized by Acharya Narendra Dev College, Govindpuri, Kalkaji, New Delhi-110019 in collaboration with Skill Enhancement Course Committee (University of Delhi), Department of Zoology (University of Delhi), Shaheed Rajguru College of Applied Sciences for Women (University of Delhi), GAD-TLC, SGTB Khalsa College, Ministry of Education, PMMMNMTT, Govt. of India and Atma Ram Sanatan Dharma College, University of Delhi August 8-14, 2023.
3. Dr Shrankhla and Dr Sushma Bharadwaj attended International Conference on Global Scenario and Sustainable Solutions in Silk Industry on 28$^{th}$ February, 2024.
4. Dr Shrankhla attended Two-day workshop on Establishment of Modalities for Skill Enhancement Courses on 4$^{th}$-5$^{th}$ March, 2024.
5. Dr Shrankhla attended One day workshop on Scientific Writing and Communication on 13$^{th}$ February, 2024.

## Appendix XI

# Exhibitions/Seminars/Training Courses Conducted

### Biomedical Science: (16)

1. Organised workshop on Graphical Abstract and Career in Publishing. March 08, 2024
2. Conducted Panel Discussion with Alumni of Biomedical Science Department. March 08, 2024
3. Organised Workshop on 'On-site monitoring of heavy metal contaminated drinking water using a handheld LD Nova luminometer'. February 15, 2024
4. Organised Forensic's Fair, the workshop on Forensic Science. February 15, 2024
5. Organised Panel Discussion on "Not All Jokes are Jokes". February 14, 2024
6. Organised Hand-on Workshop on Foldscope. February 14, 2024
7. Organised Free Health Camp in collaboration with NSS@ANDC. February 14-15, 2024
8. Co-Organised one day workshop on "Scientific Writing and Communication" organized by ANDC and ISME. February 13, 2024
9. Conducted Screening of Movie "The Vaccine War". February 13, 2024
10. Organised Cathexis'24, Department's Annual fest on the theme of Holistic Health and Gut Microflora. February 13-15, 2024
11. Organised Five Day Workshop on Online RBPT Based National Workshop on Biolgical Data Analysis with R. January 27-31, 2024
12. Organized and moderated a Webinar Series featuring clinicians with experience in delivering Phage Therapy. November 23- December 22, 2023
13. Organized an online workshop "Genome Annotation of Bacteriophages for Clinical Applications". October 25-November 7, 2023
14. Organised Cathexis'23, Annual festival of Department of Biomedical Science on the theme of "Reproductive Health". April 13, 2023
15. Organised One Day Hands-on Workshop on 'Forensic Science'. April 12, 2023
16. Organised Panel Discussion With Alumni of Biomedical Science Department as part of the Career Counselling Series. April 11, 2023

### Botany: (05)

1. Organized Workshop on Prakriti (Ayurvedic Concept of Constitution): Important Tool for Health and Disease
2. Organized National Symposium & Hands on Training on Ecosystem Restoration & Sustainability
3. Organized Online RBPT Based National Workshop on Biolgical Data Analysis with R. January 27-31, 2024
4. Organized Workshop on Role of Seed Ball Technology in Ecological Restoration
5. Organized Hands on Session on Nature-Based Bio-Enzyme Production for Sustainable Living

### Chemistry: (13)

1. Organized a five day Bootcamp on 'V-Lab Development 2.2' under the aegis of DBT STAR College Scheme from April 24-28, 2023.
2. A five day Bootcamp on 'V-Lab Development (Building Blocks of Simulator)' under the aegis of DBT STAR College Scheme A five day Bootcamp on 'V-Lab Development (Building Blocks of Simulator)' under the aegis of DBT STAR College Scheme
3. Organized a 40 hours certificate course on Basics of Research Methodology for Physical Science and Life Science students of first year from January 05, 2023 -17 June 2023.

4. A Hands-on Workshop for college students on 'Basic Language Skills' under the aegis of DBT Star College and IQAC from August 07-11, 2023
5. One week FDPon 'Sericulture: Rearing and its Application' in collaboration withSkill Enhancement Course Committee, University of Delhi, Department of Zoology, University of Delhi, Shaheed Rajguru College of Applied Sciences for Women, University of Delhi, Guru Nanak Angad Dev TLC, SGTB Khalsa College, University of Delhi and Atma Ram Sanatan Dharma College, University of Delhi, under the aegis of DBT Star College and IQAC from August 08-14, 2023
6. A three day online International Conference on Chemical and Biological Sciences (ICCBS-2024) in collaboration withthe Department of Chemistry, Atma Ram Sanatan Dharma College (University of Delhi) under the aegis of Internal Quality Assurance Cell (IQAC), in association with Kwangwoon University (South Korea), North-West University (South Africa), Acharya Narendra Dev College (University of Delhi) and SRM Institute of Science & Technology (Ghaziabad) January 27 - 29, 2024
7. A 40 hours certificate course on Practical Training in Research Methodologies for college students from October 28, 2023-April 27, 2024.
8. An e-workshop on 'Learning the Basics of ChemDraw Software'on February 18, 2024.
9. A workshop on 'Exploring the Fundamentals of Scifinder' on March 14, 2024.
10. Co-organized Annual Convention of Chemists ACC 2023, by Indian Chemical Society (ICS) in association with University of Delhi and Council of Scientific and Industrial Research (CSIR), on, IIT Delhi Campus,HauzKhas, New Delhi – 110016 from 20-21$^{st}$ Dec. 2023
11. Co-organized international conference on **Fostering Sustainable Catalysis, FSC-2024,** Organized by Department of Chemistry, University of Delhi and Maharaja SurajmalBrij University, at G-12, Maharishi KanadBhawan, (Opposite Department of Chemistry), University of Delhi, Delhi – 110007 from January 19-20, 2024
12. Organized Workshop on E-RESOURCES OF DELHI UNIVERSITY AND INFLIBNET N-LIST at Acharya Narendra DevCollege on October 26, 2023

**Computer Science: (06)**

1. Five Days workshop on "V-Lab Development (Building Block of Simulator)" held on 24$^{th}$ April 2023 to 28 April 2023 by Mr. Vaibhav Thapiyal, Mr. Vibhor Gupta, Mr. Pankaj Sahu, Students of Acharya Narendra Dev College, Delhi University.
2. Five Days workshop on "V-Lab Development 2.2" held on 24$^{th}$ April 2023 to 28 April 2023 by the students of Acharya Narendra Dev College, Delhi University. Mr. Vaibhav Thapiyal, Mr. Vibhor Gupta, Mr. Pankaj Sahu.
3. One Day workshop under the IQAC and the aegis of DBT Star College Scheme on "IOT and Cloud Computing" held on 29 February, 2024 by Dr. Nikhil Rajput, Assistant Professor, Ramanujan College, University of Delhi.
4. One Day workshop under the IQAC and the aegis of DBT Star College Scheme on "Hands on Experience in Blockchain" held on $^{5th}$ March 2024 by Prof. Ihtiram Raza Khan, Professor, Computer Science and Engineering, Jamia Hamdard Deemed University, New Delhi.
5. Five Days workshop under the IQAC and the aegis of DBT Star College Scheme on in collaboration with Department of Physics "Hands – on workshop on Arduino Microcontrollers and PCB designing" held from 18 March to 22 March 2024 by Ms. Babita Sharma and Mr. Satyam Garg, Mr. Arun Kumar.
6. Five days workshop on "One-week Bootcamp 2.1 for V-lab Development" on (11 March – 15 March, 2024) by Mr. Ayush Choudhary, Mr. Pranjal, Mr. Ayush Bhardwaj Mr. Arpit

Bhardwaj, Ms. S. Kanak Megha MR. Avishkaar Pawar and Mr. Ravi Tomar ,Students of Acharya Narendra Dev College, Delhi University.

**Electronics: (03)**

1. Department has organised 5 days workshop on Machine Learning with Python Interfacing in technical collaboration with industry partner Brain Mentors Pvt. Ltd. from September 25-29, 2023.
2. Department has organized a One-day workshop on 3D Printing Technology on September 23, 2023.
3. Department has organised 5 Day Workshop on "Internet of Things" with Our Industry Partner Brain Mentors Pvt. Ltd. from 26.02.2024- 01.03.2024.

**Physics: (02)**

1. Dr. V. Bhasker Raj and Prof. Arijit Chowdhuri were involved in organization of Hands-on training Workshop on Semiconductor Device Fabrication organized by Miranda House, University of Delhi, in collaboration with CIIDRET, UDSC and DSSEED, University of Delhi. The workshop was organized from 20 March – 3 April 2023 under the aegis of 100 days Skill Festival of University of Delhi.
2. Five Days workshop under the IQAC and the aegis of DBT Star College Scheme on Arduino Microcontrollers and PCB designing"in collaboration with Department of Computer Science from 18 March to 22 March 2024 by Ms. Babita Sharma and Mr. Satyam Garg, Mr. Arun Kumar.

**Zoology: (09)**

1. Five day Bootcamp on 'V-Lab Development 2.2 and Bootcamp on 'V-Lab Development (Building Blocks of Simulator)': Organized a five day Bootcamp on 'V-Lab Development 2.2' and 'V-Lab Development (Building Blocks of Simulator)' under the aegis of DBT STAR College Scheme. This workshop was organized for the First and Second year students of all streams of the college. The resource persons were Mr Vaibhav Thapliyal. Mr. Shahnawaz Khan and Mr. Pankaj Sahu who were final year students of B.Sc.(H) Physics, B.Sc.(H) CS and B.Sc.(P) Physical Science with CS respectively from the college.
2. Five Days workshop on "V-Lab Development 2.2" held on 24th April 2023 to 28 April 2023 by the students of Acharya Narendra Dev College, Delhi University. Mr. Vaibhav Thapiyal, Mr. Vibhor Gupta, Mr. Pankaj Sahu.
3. Summer Internship organized by Microbial Technology Laboratory, Acharya Narendra Dev College University of Delhi: Basic Techniques of Laboratory attended by Beenit Kushwaha (Galgotia's University); Tenure: 1 month from 4$^{th}$ July to 4$^{th}$ August 2023.
4. Co-organized three days International Conference on Chemical and Biological Sciences (ICCBS-2024) being organized by the Department of Chemistry under the aegis of Internal Quality Assurance Cell (IQAC), Atma Ram Sanatan Dharma College (University of Delhi) in association with Kwangwoon University (South Korea), North-West University (South Africa), and SRM Institute of Science & Technology (Ghaziabad) from January 27th to 29th, 2024.
5. Organized Seven Day Faculty Development Program on *Sericulture: Rearing and its Applications* for the faculty of University of Delhi in which hands-on experience was given on rearing methods for mulberry silkworm.
6. Organized National Workshop in collaboration with Environmental Pollution Laboratory (EPL), Department of Environmental Studies, University of Delhi, sponsored by Department of

Science and Technology (DST), Government of India.The workshop titled 'Raising Awareness on Urban Air Quality, Climate Change, Health and e-Resillience' was held on November 28th, 2023.

7. Organized One-week Bootcamp 2.1 for V-lab Development under the aegis of IQAC and DBT Star College Scheme from January 11 – 15, 2024 for the first year and second year students of all streams of the college.
8. Organized one-day ISME sponsored Hands on Workshop on "Scientific Writing and Communication" under the aegis of IQAC and DBT Star College Scheme on February 13, 2024
9. Co-Organized National Workshop on Biological Data Analysis under the aegis of IQAC and DBT Star College Scheme from January 27-31, 2024.

## Appendix XII
# Outreach Activities

### Biomedical Science :(18)

1. Prof Urmi Bajpai delivered a talk on “AMR crisis and the way forward” at the 3rd International Conference on “Antimicrobial Resistance, Novel Drug Discovery and Vaccine Development: Challenges and Opportunities” being organized by SRM University Delhi-NCR. India Habitat Centre, New Delhi. March 18 – 20, 2024
2. Prof Urmi Bajpai Chaired 6th session “Session VI” at the 3rd International Conference on “Antimicrobial Resistance, Novel Drug Discovery and Vaccine Development: Challenges and Opportunities” being organized by SRM University Delhi-NCR. India Habitat Centre, New Delhi. March 19, 2024
3. Prof Urmi Bajpai was a panelist in "Drug discovery and repurposing" theme at the BioInsight Forum, organized by BioSoc-DTU during Invictus '24, the Annual Techfest of Delhi Technological University. February 29, 2024
4. Prof Urmi Bajpai gave Invited Talk on “Bacteriophages in the pre-and post-antibiotic era” In the Luminaries Lecture Series" organized by the Department of Biotechnology, School of Engineering and Technology, School of Engineering and Technology, Manav Rachna International Institute of Research and Studies. February 01, 2024
5. Prof Urmi Bajpai delivered a talk on “Investigating structural & functional diversity of mycobacteriophage endolysins: a promising avenue to combat AMR” at the VIROCON 2023 conference ‘Advancements in Global Virus Research Towards One Health’ organized by ICAR-National Research Centre for Banana, Tiruchirappalli, Tamil Nadu and Indian Virological Society (IVS), New Delhi in Tiruchirappalli. December 01-03 2023
6. Prof Urmi Bajpai was a co-chair in the session on “Phage and Phage Therapy” at the VIROCON 2023 conference ‘Advancements in Global Virus Research Towards One Health’ organized by ICAR-National Research Centre for Banana, Tiruchirappalli, Tamil Nadu and Indian Virological Society (IVS), New Delhi in Tiruchirappalli. December 01-03 2023
7. Prof Urmi Bajpai delivered a talk on Mycobacteriophage Endolysins: Diversity in Domain Architecture and Function” at the Annual Amrita Legion for Antimicrobial Resistance Management (ALARM) two-day hybrid International Conference on “Preventing Antimicrobial Resistance Together” At Amrita School of Biotechnology, Kerela. November 17-18, 2023
8. Prof Urmi Bajpai was a Panelist in “Community Round Table” at the Annual Amrita Legion for Antimicrobial Resistance Management (ALARM) two-day hybrid International Conference on “Preventing Antimicrobial Resistance Together” At Amrita School of Biotechnology, Kerala November 17-18, 2023
9. Prof Urmi Bajpai was a Panelist in “Community Round Table” at the Annual Amrita Legion for Antimicrobial Resistance Management (ALARM) two-day hybrid International Conference on “Preventing Antimicrobial Resistance Together” At Amrita School of Biotechnology, Kerela. November 17-18, 2023
10. Prof Urmi Bajpai moderated talk of Dr Sougata Hazra Associate Professor, Department of Biosciences and Bioengineering, Joint Faculty, Centre for Nanotechnology, IIT Roorkee, India during online workshop “Genome Annotation of Bacteriophages for Clinical Applications”. November 03, 2023, 7.30-8.30 p.m.

11. Prof Urmi Bajpai moderated talk of Dr Kiran Kondabagil, Professor, Department of Biosciences and Bioengineering, IIT Bombay, Mumbai, India during online workshop "Genome Annotation of Bacteriophages for Clinical Applications". October 31, 2023, 7.30-8.30 p.m
12. Prof Urmi Bajpai delivered a talk on "Current scenario of AMR and Bacteriophage therapy from global perspectives" in a Workshop entitled "Basics of Bacteriophage Biology & Clinical Applications to Combat the Emerging Antimicrobial Resistance: A Hands-on Training. At the Banaras Hindu University, Varanasi. October 03, 2023
13. Prof Urmi Bajpai delivered a talk on "Bacteriophages: the dark matter of the biospheres" in a symposium on "Data Driven Approaches to Understand Biological Systems. At the CSIR-IGIB, Mathura Road. April 29, 2023.
14. Dr Sunita Jetly organised Free Cancer Awareness Program at various locations of Delhi & Uttar Pradesh, including:
    a. Jal Vayu Vihar, Sector 2, Noida (September 23, 2023)
    b. Luxmi Narayan Mandir Sector 56, Noida (August 06, 2023)
    c. R.G. Residency Sector 120, NOIDA (July 15, 2023)
    d. Instiute of Chartered Accountants, C56,/9A Sector 62, NOIDA (July 01, 2023)
    e. Prateek Stylome, Sector 45, NOIDA (June 04, 2023)
    f. Sector 26, NOIDA (May 06, 2023)
15. Dr Sunita Jetly organised Thallesemia Awareness Program at various locations of Delhi & Uttar Pradesh, including:
    a. Luxmi Narayan Mandir, Sector 56, Noida (September 17, 2023)
    b. Shyama Prasad Sarvodaya Vidyalaya Chitranjan Park Delhi (May 11, 2023)
    c. Ganga Ram Hospital (invited by Thalassaemic India 35 years Old NGO for thalassemia to showcase our work) (May 09, 2023)
16. Dr Sunita Jetly delivered talk on "Cancer Prevention", Jan Jagriti Foundation, Noida, community centre , Jal Vayu Vihar Noida. September 23, 2023
17. Dr Sunita Jetly delivered talk on "Holistic Health"invited by mera Sahar on the occasion of Pre Independence Celebrations Day, joint women programme, A276, sector 31, Noida, UP. August 14, 2023.
18. Dr Rimpy Kaur Chowhan delivered a talk on "Scientific Art & Creating Graphical Abstracts" in One day workshop on "Scientific Writing and Communication" organized by ANDC and ISME. February 13, 2024.

**Botany: (04)**

Dr Anita Narang was invited speaker in the joint conference of 5$^{th}$ International Conference on Biosciences and Medical Engineering & 2$^{nd}$ International Conference on Innovative Agricultural Technology at Bali, Indonesia from 30-31 August 2023

**Visits:**

1. Visit to Sanjay Van: Dr Charu K Gupta, Dr Vineet K Singh, Dr Mandeep Kaur and Dr Anita Thakur took BSc (H) Botany to Sanjay Van and Neela Hauz to study the ecology of the system on 25$^{th}$ April 2023
2. Visit to Tuglakabad Biodiversity Park: Dr Charu K Gupta, Dr Vineet K Singh and Dr Sumit Singh had taken 45 students from the department for a plantation drive on World Environment Day 5$^{th}$ June 2023.
3. Visit to Mushroom Cultivation Centre at Shaheed Rajguru College of Applied Sciences for Women: Dr Anupama Shukla and Dr Anita Narang had taken 25 students on March 18, 2024.

## Chemistry: (06)

Swachh Bharat Club and Department Of Chemistry organized the following workshop in the college under the aegies of DBT Star Scheme:

1. Tracking Life Cycle of Wet/Dry Waste in and Around the Institute
2. Cleanliness Drive
3. Identify plastic and e-waste in and around institute
4. Identify events that generate maximum waste.
5. Create Questionnaire to conduct interview of stakeholders
6. SwachhataPakhwada Rally

## Computer Science: (4)

1. Prof. Sharanjit Kaur, Poster Presentation title " Identifying structural hierarchy in social organisms using k-core Decomposition " at the 8th International Conference of Indian Network for Soil Contamination Research (INSCR-2024) on 'Exploring the Microbial World from Human Health to Environmental Sustainability' and 4$^{th}$ International Symposium on Ciliate Biology (ISCB-2024), organised by INSCR and Acharya Narendra Dev College, University of Delhi (UoD) from April 03-05, 2024 at Conference Centre, UoD, Delhi, India.
2. Prof. Sharanjit Kaur, college level jury at round-2, for meticulous evaluation of the participating teams, for next level participation at the Dark Patterns Buster Hackathon (DPBH-2023). organized by Deptt of Consumer Affairs alongwith NIT Banaras Hindu University.
3. Prof. Sharanjit Kaur, Advisor on the Selection Committee for ASRB in Feb 2024

### Visits

1. Organized an educational visit to National Science Centre, Pragati Maidan, New Delhi for the 2$^{nd}$ year students of B.Sc(H) Computer Science on February 22, 2024.

**Electronics: (20)**

1. Dr. Ravneet Kaur participated as Resource Person in a five-day workshop on "Development of Learning Outcomes based activities in Biology, Chemistry, Physics and Mathematics at Secondary Stage (Level II)." held at DESM, NCERT, New Delhi from August 21, 2023 to August 25, 2023.
2. Dr. Ravneet Kaur participated as Resource Person in a five-day workshop on "Online Course in Teaching of Science at Middle Stage." held at DESM, NCERT, New Delhi from July 31, 2023 to August 4, 2023.
3. Dr. Ravneet Kaur participated as Resource Person in a five-day workshop on "Development of Audio Video Resources based on Laboratory Manual in Science at Upper Primary Stage." held at DESM, NCERT, New Delhi from July 10, 2023 to July 14, 2023.
4. Prof. Anju Agrawal acted as a judge in the Inter-School S.T.E.M. Fest- Robotron'23, Delhi Public School, Mathura Road, August 11, 2023.
5. Dr. Ravneet Kaur acted as judge for the Inter-School S.T.E.M. Fest- Robotron'23, Delhi Public School, Mathura Road, August 11, 2023.
6. Prof. Anju Agrawal trained Raghav Aggarwal and Jaysal Manchanda of Delhi Public School, Sector 12, R. K. Puram, New Delhi on Portfolio Website Development for two months (July 1, 2023-August 31, 2023).
7. Dr. Ravneet Kaur trained Raghav Aggarwal and Jaysal Manchanda of Delhi Public School, Sector 12, R. K. Puram, New Delhi on Portfolio Website Development for two months (July 1, 2023-August 31, 2023).
8. Prof. Anju Agrawal trained Anushka Bhargava and Arjun Bhargava of Delhi Public School, Mathura Road, New Delhi on Coding Bootcamp for one months (February 1-29, 2024).
9. Dr. Ravneet Kaur trained Anushka Bhargava and Arjun Bhargava of Delhi Public School, Mathura Road, New Delhi on Coding Bootcamp for one months (February 1-29, 2024).
10. Dr. Ravneet Kaur participated as Resource Person in a five-day workshop on "Development of Learning Outcomes based activities in Biology, Chemistry, Physics and Mathematics at Secondary Stage (Level II)." held at DESM, NCERT, New Delhi from August 21, 2023 to August 25, 2023.
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12. Dr. Ravneet Kaur participated as Resource Person in a five-day workshop on "Development of Audio Video Resources based on Laboratory Manual in Science at Upper Primary Stage." held at DESM, NCERT, New Delhi from July 10, 2023 to July 14, 2023.
13. Prof. Anju Agrawal and Dr. Ravneet Kaur served as Judge for the Inter-School S.T.E.M. Fest-Robotron'23, Delhi Public School, Mathura Road, August 11, 2023.
14. Prof. Anju Agrawal and Dr. Ravneet Kaur trained Raghav Aggarwal and Jaysal Manchanda of Delhi Public School, Sector 12, New Delhi for duration of two months (July 1, 2023- August 31 2023 on Portfolio Website Development.
15. Dr. Ravneet Kaur and Dr. Monika Bhattacharya served as Expert Reviewer for IT related Vocational Education courses at Bhartiya Shiksha Board (BSB).
16. Prof. Anju Agrawal acted as a judge in the Inter-School S.T.E.M. Fest- Robotron'23, Delhi Public School, Mathura Road, August 11, 2023.
17. Dr. Ravneet Kaur acted as judge for the Inter-School S.T.E.M. Fest- Robotron'23, Delhi Public School, Mathura Road, August 11, 2023.
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Sector 12, New Delhi on Portfolio Website Development for two months (July 1, 2023-August 31, 2023).

19. Dr. Ravneet Kaur trained Raghav Aggarwal and Jaysal Manchanda of Delhi Public School, Sector 12, New Delhi on Portfolio Website Development for two months (July 1, 2023-August 31, 2023).

**Visits**

1. Organized an excursion to The Bureau of Indian Standards for the students of B.Sc(H) Electronics and SPIE society chapter member @ANDC, on April 7, 2023.

**Physics: (02)**

1. Two month long hands-on training of 05 (five) students on advanced thin film deposition and characterization equipment at Smart Materials and Devices Laboratory at Miranda House, University of Delhi, Delhi – 110 007 during June – July 2023.
2. Organized an educational visit on 31 May 2023 for 09 students to Dr. Anjali Sharma Kaushik's Material Science research laboratory in ARSD College, University of Delhi, Dhaula Kuan Enclave I, Dhaula Kuan, New Delhi, Delhi – 110 021

**Zoology: (20)**

1. Prof. Sarita Kumar Took classes for the students pursuing M.Sc. Public Health Entomology (PHE) course, Academic Session 2023-2025, at ICMR-RMRC, Dibrugarh, Assam - MPHE-204 'Control of Vectors of Public Health Importance'.
2. Prof. Sarita Kumar was Resource person in the workshop on 'Modification and Development of Biology and Biotechnology Laboratory', NIE, DESM, 24-28$^{th}$ July, 2023.
3. Prof. Sarita Kumar was Resource person in the workshop on 'Modification and Development of Biology and Biotechnology Laboratory', NIE, DESM, 9-13$^{th}$ October, 2023.
4. Prof. Sarita Kumar was Resource person in the workshop on 'Developing textbooks in Science for Classes 6 and 9', NIE, DESM, 15-19$^{th}$ January, 2024; 29$^{th}$ January-2$^{nd}$ February, 2024.
5. Prof. Sarita Kumar Delivered a talk on 'Silkworm Pests and Diseases' during Faculty Development Program on *'Sericulture Rearing and its Application*', AND College, 9 August, 2023.
6. Prof. Sarita Kmar is Member of the Scientific Advisory Committee (SAC) of ICMR-RMRC-NE, Dibrugarh, Assam for reviewing ongoing scientific endeavours and new project proposals.
7. Prof. Sarita Kmar was External expert in the Expert Committee formulated to finalise the course and Curriculum Framework of the B.Sc. degree (multidisciplinary) programme under UGC-CCFUP 2022, IGNOU; 3$^{rd}$ November, 2023.
8. Prof. Sarita Kmar was External expert in the Expert Committee formulated to finalise the syllabus of APM-01 (Integrated Pest Management), a skill-based course for BDP program, IGNOU, 30$^{th}$ Jan 2024.
9. Prof. Sarita Kmar was Expert in the Doctoral Committee meeting for Ph.D. (Life Sciences) Programme of IGNOU, held in 2$^{nd}$ April, 2024.
10. Prof. Sarita Kmar conducted interviews for the post of **PGT (Biology)** at Mata Jai Kaur Public School, Ashok Vihar, 17$^{th}$ February 2024
11. Prof. Ravi Toteja delivered an invited talk on Enhancing Education: The importance of internship and undergraduate research on March 01, 2024 in FDP organized by National Institute of Educational planning and Administration (NIEPA).
12. Prof. Sarita Kmar was External expert in the Expert Group Meeting of Scientific Advisory Committee, RMRC NE, Dibrugarh, held on 5-6 April, 2024.

13. Prof. Seema Makhija delivered an invited talk on Ecotoxicological Risk Assessment of Heavy metals in Ciliates by using Cellular, Molecular and Bioinformatics Approaches in 4th International Conference on Recent Trends in Life Sciences and Biotechnology organized by International Association of Zoologists, Siddhi Artha Group of Education in collaboration with Department of Biosciences and Technology, Maharishi Markandeshwar (Deemed to be University), Mullana-Ambala and Sharda Institute of Science Technology Education & Research.
14. Prof. Seema Makhija delivered an talk and conducted workshop on Facinating World of Microbes, Protozoans and Career Opportunities' in G.D. Goenka University, Gurugram on May 16, 2023.
15. Students of Sri Venketeswara College, studying Insect Vector and Diseases, visited the mosquito rearing laboratory on 21st March, 2024.
16. Students pursuing M.Sc. in Public Health Entomology (MPHE) course at ICMR-RMRC, Dibrugarh, visited the Insect Pest & Vector laboratory and ANDC on 24th Nov, 2023.
17. Undergraduate Students from different colleges of University of Delhi visited the Sericulture Skill centre as a part of their curriculum.on 21.10.2023, students of B.Sc life sciences 6 Semester form Shivaji College and students of B.Sc 1st Semester from Maitreyi College visited the sericulture facility.On 3rd Nov 2023, B.Sc life sciences students 6th semester from Zakir Hussain College came to visit the silkworm culture. During the visits, students were briefed about the sericulture practices and visited the mulberry garden. They observed the various stages of silk moth. Hands-on training was given on the post-cocoon treatments including stifling, deflossing, degumming' and reeling the silk from the cocoons on mulberry silkworm.

## Visits

1. Department of Zoology organized one-day educational trip under the aegis of DBT-STAR college scheme to National Zoological Park, New Delhi on 7 th March 2024.Total of 40 students of B.Sc. (H) Zoology 4 th semester along with 3 staff members visited the park to observe behavior of various animals for their Animal Behaviour paper.
2. Organized Students educational trip to the **National Centre for Disease Control, New Delhi** on 19th April, 2024.
3. Organized Students educational trip to the Entomological Department, ICAR, PUSA, New Delhi on February 08, 2024.

## Appendix XIII
# Invited Lectures

### Biomedical Science: (18)

| S.No. | Name of guest/ faculty | Designation | Title | Date |
|---|---|---|---|---|
| 1 | Dr. Mzia Kutateladze | Director, G. Eliava Institute of Bacteriophages, Microbiology, and Virology & President of the Eliava Foundation | Georgia's Experience and Perspective on Phage Therapy | December 22, 2023 |
| 2 | Dr Gopal Nath | Banaras Hindu University | Compassionate Phage Therapy : Experience from India | December 19, 2023 |
| 3 | Dr Jonathan Irdell | Infectious Diseases Physician, Westmead Hospital, Sydney | Phage Australia | December 11, 2023 |
| 4 | Dr Robert Chip Schooley | Professor, University of California, San Diego and co-director of IPATH | Unsettled Issues in Phage Therapeutics | December 05, 2023 |
| 5 | Dr Gina Suh | Infectious Disease Specialist, Mayo Clinic, USA | Phage Therapy Compassionate Use Cases: Mayo Clinic Experience | November 23, 2023 |
| 6 | Dr Archna Tayal | Psychologist and Career Analyst | Union of Mind and Body | February 15, 2024 |
| 7 | Mr Ivan Denisov | Core team member of Limited Liability Company, Digital Sensory Technologies, Russia | Recent Trends in Bioluminescence Research and Their Implications | February 15, 2024 |
| 8 | Prof. Uma Chaudhary | Professor, Bhaskaracharya College of Applied Science, University of Delhi | Foldscope : History and Applications | February 14, 2024 |
| 9 | Dr Debasis Dash | Chief Scientist, Informatics & Big Data | Quality Control of Variant Peptides in Proteogenomics-Catching the (Un)Usual Suspects | July 04, 2023 |
| 10 | Dr Anil Kaura | Fingerprint Master, Orient Sourcing Solutions | Crime Scene Investigation | April 12, 2023 |
| 11 | Mr Shubham Gautam | Cyber Forensic Strategist, Psyberbull | Cyber Forensics | April 12, 2023 |
| 12 | Ms. Afreen Tarannum | Director, Academic Affairs, SIFS, India | Handwriting and Fingerprint Analysis | April 12, 2023 |

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| **13-18** | Dr Pawan Mehrotra | Managing Director, Aarna Biomedical Products- A Social Healthcare Enterprise | Panel Discussion with Alumni | April 11, 2023 |
| | Harshit Arora | MBA Healthcare Management, Goa Institute of Management | | |
| | Alok Anand | PhD Scholar, IIIT Delhi | | |
| | Mrinal Chawla | Indian Audit and Account Services (IAS) | | |
| | Animesh Kar | PhD SRF, Regional Center for Biotechnology, Haryana, India | | |
| | Sonanjali Aneja | PhD Scholar, National Institute of Immunology, Delhi, India | | |

**Botany: (13)**

| S.No. | Invited Speaker | Affiliation | Title | Date |
|---|---|---|---|---|
| 1 | Mr Kunal Satyarthi | Joint Secretary (Advisor)National Disaster Management Authority, Ministry of Home Affairs, GoI | Climate Change and Disaster Management | October 13, 2023 |
| 2 | Ramesh Guguloth | Assistant Professor, A&U Govt Tibbia College, Delhi | | November 30, 2023 |
| 3 | Neha Rawat | Assistant Professor, A&U Govt Tibbia College, Delhi | | November 30, 2023 |
| 4 | Dr. M. Shah Hussain | Associate Professor, University of Delhi | Ecological Restoration for India's Commitment to the Bonn Challenge and UN Decade of Ecosystem Restoration (2021-2030) | February 22, 2024 |
| 5 | Prof. Yamini Gupt | Professor, University of Delhi | Valuation of Ecosystem Services in Urban Parks | February 22, 2024 |
| 6 | Professor Radhey Shyam Sharma | Professor, , University of Delhi | Ecological Entrepreneurship for Nurturing Viksit Bharat for Peace, Progress, and Prosperity | February 23, 2024 |

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| 7 | Dr. Dheeraj Mittal | IFoS | Mission LiFE: An India-led global mass movement to nudge individual and community action to protect and preserve the environment and biodiversity | February 23, 2024 |
| 8 | Dr Hara Prasad Mishra | Pharmaceutical Physician & AI Researcher Gen AI 4 Healthcare | | January 27, 2024 |
| 9 | VasuDev Singh | Deep Learning Researcher | Biomedical Image Data Analysis | January 28, 2024 |
| 10 | Dr. Sumeet Patiyal | Post Doc. Fellow, NIH, USA | Fundamentals of Biostatistics | January 29, 2024 |
| 11 | Dr. Neel Das | Senior AI Expert, Roche Healthcare | Prompt Engineering for Biomedical Data Sciences | January 31, 2024 |
| 12 | Shisba Chawla | Advocate, Supreme Court | Cyber Law | March 12, 2024 |
| 13 | Dr. Jaspreet Kaur Dhanjal | Assistant Professor, IIIT, Delhi | Personalized Medicine and Big Data in Healthcare | January 30, 2024 |

**Chemistry: (02)**

| S.No. | Invited Speaker | Affiliation | Title | Date |
|---|---|---|---|---|
| 1 | Prof.Alok Srivastava | P. U. Chandigarh | G20 Initiative LiFE from the perspective of Energy issue | |
| 2 | Mr. DevanshVashistha | Advocate | Patents and IPR | 19th March. 2024. |

**Computer Science: (06)**

| S.No. | Invited Speaker | Affiliation | Title | Date |
|---|---|---|---|---|
| 1 | Dr. Ihtiram Raja Khan, | Associate Professor, Department of Computer Science and Engineering, Jamia Hamdard University. | Blockchain in Education | 11th April 2023 |
| 2 | Dr. Navneet Sood, | Senior Consultant in Pulmonology, Dharamshila Narayana Hospital. | How to keep your lungs health despite pollution" | 25th August 2023 |

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| 3 | Ms. Aakansha Rehan | Senior Data Scientist in Capgemini IT Pvt. Ltd. Services Gurugram, Haryana. | Data Drive: Surfing the waves of AI Innovation | 25th February2024 |
| 4 | Dr. Nihar Ranjan Roy | Associate Professor, Department of Computer Science, Sharda University, Greater Noida, U.P. | Quantum Computing & Cyber Security: A New Era of Challenges | 16th March 2024 |
| 5 | Mr. Sudesh Chandel | Principal Data Scientist in AT&T India Pvt. Ltd., Hyderabad | Use of Machine Learning In Video Streaming | 17th March 2024 |
| 6 | Dr. Narendra Nath Dalei | Associate Professor, Department of Economics, Central University of Himachal Pradesh | Developing an Excellent Research Paper while adhering to Original Research and Publication Ethics | 22nd March 2024 |

**Electronics: (01)**

| S. No. | Name of guest/ faculty | Designation | Title | Date |
|---|---|---|---|---|
| 1 | Prof. H.C. Verma | Retired Prof., Dept. Of Physics, IIT Kanpur | TALK SHOW during Optics Outreach Culmination | October 06, 2023 |

**Physics: (01)**

| S. No. | Name of guest/ faculty | Designation | Title | Date |
|---|---|---|---|---|
| | Prof. Dhananjay V. Gadre | Professor at the Netaji Subhas University of Technology in the Department of Electronics and Communication Engineering and founder Director of CEDT and TI-CEPD. | 'Tinkering for Physics' | |

**Zoology: (20)**

| S.No. | Invited Speaker | Affiliation | Title | Date |
|---|---|---|---|---|
| 1 | Dr. Thallapally Mogili | Scientist (Retd.) Central Sericultural Research and Training Institute, Mysuru | Propagation, Pruning and Cultivation of Mulberry | August 09, 2023 |
| 2 | Prof V.B. Upadhyay | Head, Deptt of Zoology (Retd.) DDU Gorakhpur | Basics of Sericulture | August 09, 2023 |

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| | | University, Gorakhpur, Uttar Pradesh | | |
| **3** | Dr Sardar Singh | Scientist D and Head<br>RSRS, CSB, Sahaspur, Dehradun | Hatching of eggs and Chawki silkworm rearing technique | August 10, 2023 |
| **4** | | | Different Techniques of late age silk worm Rearing | |
| **5** | Mr Surinder Bhat | Scientist D, Silk Technical Service Center, CSB, Premnagar, Dehradun | Post coccon Technology | August 11, 2023 |
| **6** | Dr. Deepti Gupta | Professor<br>IIT Delhi | Extraction and applications of sericin biomolecule | August 12, 2023 |
| **7** | Dr. Yeruva Thirupathaiah | Scientist-C<br>CSRTI, Mysuru | Use of Pupae in Livestock Feed and Cosmetics | August 12, 2023 |
| **8** | Dr. K.M. Vijaya Kumari, | Director<br>CMER&TI, Lahdoigarh, Jorhat, Assam | Eri and Muga Sericulture in India | August 14, 2023 |
| **9** | Dr. Vivek Kumar Choudhary | Scientist Incharge & Field Biologist,<br>Tughlaqabad Biodiversity Park<br>CEMDE, University of Delhi | Integrating Tasar cultivation in an ecological restoration process for conservation of Vanya silkworm and development of sustainable livelihood option for local tribal at a degraded mined-out area of Purnapani, Odisha" | August 14, 2023 |
| **10** | Prof. Chirashree Ghosh | Professor, Department of Environmental Science, University of Delhi | Actual causes and condition of air in the National Capital Delhi | November 28, 2023 |
| **11** | Prof. Shachi Shah, | Professor & Head, SOITS, IGNOU | importance of science and different visions in it for the world | November 28 |
| **12** | Prof. Namita Rajput, - " | Shri Aurobindo College, University of Delhi | Creating Safe campus: Understanding and Implementing UGC guidelines for gender Sanitization" | November 28 |
| **13** | Mr. Gaurav , | Assistant Professor, Ramanujan College, University of Delhi | Snakes in the city | November 28 |
| **14** | Dr Devraj Joshi | Associate ProfessorTribhuvan UniversityNepal | ISME activities in Nepal and organisation of SASME (South Asian Symposium for Microbial Ecology) | February 13, 2024 |

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| **15** | Prof. Rup Lal | ISME Ambassador, India Acharya Narendra Dev College University of Delhi | Introduction to ISME and Activities in India<br><br>Importance of Scientific Writing and Communication: How to publish in ISME journals | February 13, 2024 |
| **16** | Dr Jasvinder Kaur | Assistant Professor Gargi College University of Delhi | "Scientific reading exercise" Section A: How to read a paper | February 13, 2024 |
| **17** | Dr Pushplata | Assistant Professor Department of Zoology University of Delhi | Scientific reading exercise" Section B: Peer-Review Process | February 13, 2024 |
| **18** | Dr Utkarsh Sood | Assistant Professor Kirori Mal College University of Delhi& Editor ISME Communications | Introduction to ISME Journals | |
| **19** | Dr Komal Kamra | Associate Professor (Retd.) SGTB Khalsa College, University of Delhi | Interactive Session on Let's think science | April 27, 2023 |
| **20** | Dr Alan Warren | Natural History Museum, London | What have Ciliates Done for us | March 05, 2024 |


INTERNATIONAL CONFERENCES, WORKSHOPS AND OUTREACH PROGRAMS

## Appendix XIV

College has collaborated with several institutes of International repute and signed several MoUs in order to improve the learning possibilities for their respective students and teachers,

### *Science Setu: Memorandum of Understanding (MoU) between ANDC & NII*

The National Institute of Immunology and Acharya Narendra Dev College joined together to launch the NII-Acharya Narendra Dev College Science *Setu*Programme. Such an endeavor is urgently needed since it raises public understanding of the value of science. The main objective is to support the national initiative to entice more and more talented young minds to choose a profession in science and technology.The endeavor would take into account the evolving requirements of biological sciences education, learning, and research. Additionally, it would support the delivery of innovation, research, and continual improvement by involving a talent pool of future biology students. In addition, the endeavor will integrate the undergraduate teaching in biology to the NII in the idea of "success through access."Theprogramme will use on-site and/or online learning methods to accomplish its goals and objectives (depending upon the feasibility).Lectures and discussions, laboratory exercises, summer student and teacher internships,mentorship for student and teacher science projects, career opportunities, cutting-edge teaching and research methodologies, science and technology policy concerns are all possible under the programme. Other relevant activities are another option, as long as it is mutually agreed upon. The programme will inculcate the value of science among students and choose a profession in science.

### MoU with International Bacteriophage Research Consortium (International)

MoU between Acharya Narendra Dev College, University of Delhi and Open Health System Laboratory (OHSL), a social benefit corporation established under the laws of the state of California in the United States of America covers collaboration to establish an International Bacteriophage Research Consortium (IBRC) and pursue further research. ANDC-DU and OHSL have already created a web portal for 1BRC with the url:
https://ohsl.us/bacteriophage/international-bacteriophage-research-consortium
Working together ANDC-DU and OHSL will be developing funding proposals to support and equip research and research facilities at the drug discovery laboratory of the Department of Biomedical Sciences and complementary facilities at the International Research centre of Open Health System Laboratory which will be established in Jhajjar, Haryana in the Indian Institute of Technology, Delhi Biotechnology, Park.

### MoU with Auburn University of Montgomery, Alabama, USA (International)

Acharya Narendra Dev College, University of Delhi, India and Auburn University of Montgomery, Alabama, USA, have created a cooperative alliance. The program would encourage international credit transfer and progression arrangements, academic articulation agreements for various programs, the exchange of research and academic materials of mutual interest, collaborative and foster research activities and projects, the exchange of teaching expertise, the development of e-learning training, and the application of distance learning.

### *Collaboration with IIT, Delhi for creation of Virtual Labs*

College has been recognized as nodal centre for creation of virtual labs, an initiative of MoE, under NMEICT. Theoretical concepts can be delivered to students online but for better understanding of various

concepts, a hands–on is a must. ANDC has conceptualized the idea of Virtual lab (V-lab) to provide remote access of various labs to the undergraduate science students through internet.

### *MoU with Entrepreneurship Cell, School of open learning, University of Delhi*

ANDC, in collaboration with Entrepreneurship cell, School of open learning, University of Delhi will be offering certificate course in Entrepreneurship and start up under the UGC scheme of "National skills qualifications framework". The course can be done after 10+2 and will be of six months duration. This collaboration will also provide the potential entrepreneurs from ANDC with assistance in availing the entrepreneurship schemes by central and state government.

### *Th!nk Lab– Collaboration with CUBE*

Th!nk Lab is an autonomous lab of the students, which works without any supervision of teachers in collaboration with CUBE (Collaborative Understanding Biology Education) network, an initiative of Homi Bhabha Centre for Science Education, TIFR, Mumbai. Under the network, students are connected with students, teachers and research scientists across the country and abroad to discuss and seek answers to various research questions.

### Skill Hub @ ANDC

The National Education Policy (NEP) 2020 has recommended incorporation of vocational skills into School and Higher Education curriculums so that students can design their own paths of study and life plans. The 'Skill Hubs Pilot' is implemented under central component of Pradhan Mantri Kaushal Vikas Yojana 3.0 (PMKVY 3.0) through National Skill Development Corporation (NSDC) with the support of State Skill Development Missions (SSDMs), State Education Department/Agencies and District Skill Committees (DSCs).This year Acharya Narendra Dev Kaushal Kendra, Skill Hub @ ANDC is selected as a Training Provider for Web Developer Course, and a batch of 19 students has successfully completed the course in 2022.

### University of Delhi @ ANDC SPIE Student Chapter

The Society of Photo-Optical Instrumentation Engineers (SPIE), an international society advancing an interdisciplinary approach to the science and application of light, formally approved University of Delhi at Acharya Narendra Dev College SPIE Student Chapter in August 2010. The chapter is open to both students of Acharya Narendra Dev College and University of Delhi. With its establishment, college has joined the elite group within India of IITs, IISc, NIITs and DTU where this chapter has been successfully running for years besides more than 150 well established chapters in other countries like USA, UK, Europe, China, Russian Federation and Canada etc.

### MoU with PhiXgen Pvt, Ltd.

MoU between ANDC and PhiXgen Pvt. Ltd., a company was established on January 30, 2018. PhiXgen Pvt. Ltd and ANDC will work together to explore activities of mutual interest that endeavor to advance research and improve bioinformatic skills and their responsible application worldwide. Specific activitieswill be outlined in a separate PhiXGen-ANDC work plan for individual events. The major focus of the firm is to work towardsinnovation, development, deployment, and commercialization of products andservices. The work mandate includes providing technical services to beginners whoare facing difficulties in their projects This primarily includes support for NextGeneration Sequencing projects for Genomics, Transcriptomics and Proteomicsstudies. We purpose to serve various national and international government andprivate sector agencies like industries/universities/colleges/autonomous

bodies/departments etc. The wide scope of the firm also includes onsite/offsite/online training courses for graduates/post-graduates and corporate professionals.

## Appendix XV

# External Students Interns Trained under ANDC Faculty

### External Students Interns Trained under ANDC Faculty

| S. No. | Supervisor (Department) | Candidate | Project title |
|---|---|---|---|
| 1. | Prof. Urmi Bajpai (Biomedical Science) | Mr Imaad, M.Sc. (Biotechnology), Central University of Haryana. (February-June, 2023) | Cloning, expression and purification of Mycobacteriophage-encoded Lysin enzyme. |
| 2. | | Ms Shreya Saxena, M.Sc. (Biotechnology), Banasthali (January-June, 2023) | Isolation and Characterization of Novel Mycobacteriophages and *In vitro* Analysis of Recombinant LysinB |
| 3. | Prof. Geetu Gambhir (Chemistry) | Ms. Nishitha, M. Sc. Amity University | Tamarind (TKP) based nanocomposite for mitigation of Dyes from waste water. |
| 4. | | | Magnetic Tamarind (TKP) -GO biocomposite for mitigation of Dyes. |
| 5. | Ms. Preeti Marwaha (Computer Science) | Mayank Singh Pundir, BITS Pilani | Use of Machine Learning andKnowledge Representation techniques toclassify and organize the microbial information of polluted Soil and Water in Delhi. |
| 6. | Prof. Sarita Kumar | Ms. Sanskriti Ojha (Pursuing March 2024 onwards) | Effect of xenobiotics on the biochemical constituents of mosquitoes. |
| 7. | Prof. Anju Agrawal Dr. Ravneet Kaur (Electronics) | Raghav Aggarwal Jaysal Manchanda | Portfolio Website Development |
| 8. | Prof. Monisha Khanna Kapur (Zoology) | Beenit Kushwaha (Galgotia's University) | Basic Techniques of Laboratory, Tenure: 1 month from 4th July to 4th August 2023 |
| 9. | Prof. Ravi Toteja Prof. Seema Makhija (Zoology) | Merwin Mammen Mathew M.Sc. Microbiology Department of Biosciences, Jamia Milia Islamia, New Delhi | Identification of bacterial species growing in Pringsheim's medium which serve as prey for ciliates. |
| 10. | | Ankush M.Sc. Biotechnology Department of Biotechnology, School of Interdisciplinary and Applied Life Sciences, | Physico-chemical properties of soil and identification of soil ciliates from morphologically and molecular systematics. |

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| | | Central University of Haryana, Mahendragarh, Haryana | |
| **11.** | | Nidhi Bisht<br>M.Sc. Biotechnology<br>Graphic Era (Deemed to be University), Dehradun | To Study the Effects of Chromium and Arsenic on Eukaryotic Microbes, Paramecium sp. and Tetmemena sp. |
| **12.** | | Akshita<br>M.Sc. Biotechnology<br>Graphic Era (Deemed to be University), Dehradun | To study water quality parameters and ciliate diversity in the Delhi NCR stretch of river Yamuna, India. |
| **13.** | | Simran Chopra<br>B.Sc. Life Sciences II Year<br>Miranda House, University of Delhi. Delhi | Basic culturing and identification techniques for ciliates. |
| **14.** | Prof. Anju Agrawal<br>Dr. Ravneet Kaur<br>(Electronics) | Anushka Bhargava<br>Arjun Bhargava<br>Delhi Public School, Mathura Road, New Delhi | Coding Camp- Html, CSS and JS<br>Platform used :- vs code |
| **15.** | Prof. Seema Makhija & Prof. Ravi Toteja<br>Dept. of Zoology | Simran Kashyap | Assessing water quality parameters and ciliate diversity in Wazirabad region of YamunaRiver: APost-Najafgarh drain analysis. |
| **16.** | Prof. Seema Makhija & Prof. Ravi Toteja<br>Dept. of Zoology | Anas Malik | Assessing water quality parameters and ciliate diversity in Wazirabad region of YamunaRiver: APre-Najafgarh drain analysis. |
| **17.** | Prof. Seema Makhija & Prof. Ravi Toteja<br>Dept. of Zoology | Jessica Kashyap | Exploring symbiotic relationship: A study of paramecium's endosymbionts and basic techniques |
| **18.** | Prof. Seema Makhija & Prof. Ravi Toteja<br>Dept. of Zoology | Muskan Kumari | Analyzing Universal Primer (ITS,18S) efficacy in *Tetmemena* sp. using DNA Barcoding |

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