Acharya Narendra Dev College

DBT STAR STATUS 2020
Progress Report
(September 2021-August 2022)

Assessment duration : 2021-2022 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./, 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	05	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	06	01

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

(You may enumerate 5 minor projects where students were involved and their impact or similar activities and their outcome; this is for representative purpose and coordinator may include details as per his own choice; kindly refrain from providing philosophical data Avoid any introduction. All the justifications must be very crisp like any aspect non-existent pre-STAR Scheme and you achieved after the grant).

The seven departments of the College involved in the DBT STAR STATUS AND STAR COLLEGE programme have been executing the scheme excellently, focusing on its goals and objectives.

1. The grant by DBT under STAR College Scheme has helped the College in developing New Research Facilities (Appendix I) and state of Art Laboratories for skill enhancement of all the stakeholders of the Institute (Appendix II)).

a. Mushroom Research and Skill Development Centre
b. Zebrafish Culture Facility

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

2. The funds had also helped in organizing two international e-conferences by the college that not only gave an opportunity for our students and faculty members to present their research work at an international platform but also attracted students and scholars across the country to participate (Appendix III).

3. Under this scheme, College took new initiatives like Development of Virtual Laboratories, VLab@ANDC. During COVID – 19 pandemic students and faculty alike realized the necessity and usefulness of virtual platforms in understanding basic concepts of various topics in teaching-learning process. The lists of virtual videos created by students of ANDC uploaded on ANDC website (https://www.vlab.andcollege.du.ac.in), experiments created in the virtual laboratory and tutorial videos created by faculty of Department of Physics as classroom support material are indexed in Appendix IV. The course structure of various labs and experiments available on Vlab@ANDC is futuristic, following the four-quadrant model for e-content developed, considering the National Education Policy (NEP)-2020. The Vlab@ANDC website is created and maintained by our own students for four domains i.e., Biological Sciences, Chemical Sciences, Electronics and Physical Sciences which include seven departments i.e., Biomedical Science, Botany, Chemistry, Computer Science, Electronics, Physics and Zoology.

4. DBT Star College grant has given a fillip to conduct of hands-on Interdisciplinary Projects at the undergraduate level (Appendix V). Working hands-on in a free and conducive environment has resulted in the students having their own publications and winning many awards and accolades at the undergraduate level (Appendix VI). It is readily envisioned that this kind of exposure and UG student participation will lead to students choosing higher education as a viable career option. The financial help from DBT Star College scheme has gone a long way in providing support as also inspiring faculty members to rekindle their spirit of research by way of writing books, contributing chapters in books, garnering academic awards, publishing in Scopus indexed Journals / Proceedings and peer reviewed international/national journals of repute and the same are indexed in Appendix – VIII.

5. The College is now collaborating with several institutes of eminence for research activities and professional development of all the stakeholders (Appendix XIII). The College has also seen reduction in college dropout rates and increase in students pursuing higher education in basic science subjects. All the Departments of the College have started working more as a homogenous group with sharing of experitise and facilitating mobility of students among the departments.

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

A. Novel Aspects Introduced

i. The College under the aegis of DBT Star College Scheme organized an Interdisciplinary One-week long International conference (ICMCESA-22) where students got chance to interact with several national and international eminent speakers (Appendix III)
ii. Some of the workshops like workshop for development of V-Lab@ANDC was conducted by the students of the College to provide hands-on training to other students (Appendix IV)
iii. Mushroom Culture Facility and Zebra fish culture facility has been created in the College premises (Appendix I)
iv. Organized Skill Enhancement Workshops for the Non Teaching Staff (Appendix XI)

v. Outreach Programs were also conducted both in hybrid mode for School Students and their teachers (Appendix XI).
vi. The State-of-art Laboratories of all the Departments has fecilitated school students/UG/PG students to work as summer interns (Appendix II)

B. Planning

i. To introduce more hands-on offline as well as virtual lab experiments according to the NEP syllabi of the University.
ii. To mentor Institutes in rural areas to apply for DBT STAR College Scheme.
iii. Collaborations with Institues of Eminence to give UG/PG students an opportunity to work as team members in their ongoing projects.
iv. Encourage Science communication by providing financial aid to students and faculties for publishing research papers and attending useful seminars/workshops.
v. Visit to various research institutes to broaden student network and scientific exposure.

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

The Covid-19 pandemic has paved way for introducing newer ways of teaching and learning through online mode. Demonstration by introducing virtual lab experiments has provided a new dimension to students to understand the procedure and concept of the techniques in a better way. Conduction of Interdisciplinary projects/ workshops/ seminars has helped the students' in their holistic development which will eventually broaden up their horizon of knowledge.

Initially there were problems with PMFS but with the co-operation of DBT Staff members, everything was sorted smoothly.

Key Performance Indicators

S. No.	Indicator	Pre-support (2014-2017)	During /After Support (2021-2022)
1	No. of students passing out (%) Students Admitted/passing out (pass %)	100%	100%
2	No. of students opting for M.Sc.	Biomedical Science: 09 Botany: 07 Chemistry: 21 Computer Science: 08 Electronics: 09 Physics: 07 Zoology: 08	Biomedical Science: 15 Botany: 20 Chemistry: 12 Computer Science: 17 Electronics: 26 Physics: 38 Zoology: 18
3	Average marks (CGPA)	Biomedical Science: 7-8 Botany: 7-8 Chemistry: 7-8 Computer Science: 8-9 Electronics: 8-9 Physics: 8-9 Zoology: 7-8	Biomedical Science: 9 Botany: 8 Chemistry: 8 Computer Science: 8 Electronics: 8-9 Physics: 8-9 Zoology: 8-9
4	No. of new experiments introduced (Appendix VII)	NIL	Biomedical Science: 05 Botany: 16 Chemistry: 19 Computer Science: 46 Electronics: 73 Physics: 29 Zoology: 37
5	Publications (scopus indexed) /patents, if any (Appendix VIII)	Biomedical Science: 05 Botany: 04 Chemistry: 04 Computer Science: 04 Electronics: 02 Physics: 12 Zoology: 10	Biomedical Science: 17 Botany: 05 Chemistry: 38 Computer Science: 13 Electronics: 06 Physics: 15 Zoology: 14
6	Training received by faculty (Appendix IX)	Biomedical Science: 08 Botany: 03 Chemistry: 03 Computer Science: 00 Electronics: 00 Physics: 04 Zoology:06	Biomedical Science: 04 Botany: 11 Chemistry: 11 Computer Science: 07 Electronics: 28 Physics: 08 Zoology:10

7	Exhibitions/seminars /training courses conducted (Appendix X)	Biomedical Science: 04 Botany: 04 Chemistry: 03 Computer Science:04 Electronics: 03 Physics: 02 Zoology: 04	Biomedical Science: 06 Botany: 06 Chemistry: 06 Computer Science:07 Electronics: 04 Physics: 04 Zoology: 06
8	Outreach activities (Popular lectures) (Appendix XI)	Biomedical Science: 07 Botany: 06 Chemistry: 02 Computer Science:2 Electronics: 05 Physics: 02 Zoology: 06	Biomedical Science: 14 Botany: 11 Chemistry: 03 Computer Science:03 Electronics:11 Physics: 17 Zoology: 12
9	Colleges mentored to apply for DBT Star College grants	NA	One
10	Interdisciplinary Projects (Appendix V)	Nil	56
11	Invited lectures (Appendix XII)	02 Lectures/Year/Departm ent	Biomedical Science: 03 Botany: 06 Chemistry: 06 Computer Science:06 Electronics: 04 Physics: 12 Zoology:18

Appendix I

Development of Research Facilities

(A) Mushroom Research and Skill Development Centre

Mushroom Research and Skill Development Centre (MRSDC) at Department of Botany, Acharya Narendra Dev College is set up under the aegis of DBT-STAR status scheme. There are two labs in the centre, one is Microbial Culture Facilty (MCF) and other one is Mushroom Production Unit (MPU). The centre is established as a research and development facility in the field of Microbiology (especially mushrooms) as well as to enhance the skill of mushroom cultivation amongst the students. The centre has state of the art facility for the production of various types of mushrooms along with the culture facility for other microbes as well. Microbial Culture Facility has Biosafety Level-II cabinet, an incubator shaker, humidity chamber and rotavapor. Mushroom production unit (MPU) has mushroom racks, humidifier and autoclave unit. The centre is also developing the library of various economically important mushroom species and other microbial cultures. Till now, the centre has cultures of 10 species of mushrooms.

(B) Zebrafish Culture Facility

Zebrafish Culture facility under aegis of DBT Star Scheme was established at Acharya Narendra Dev College in January 2022 with the aim to encourage scientific minds towards research, to gain hands on experience of lab work, to indulge in fascinating world of live animal research and to gain more empathetic attitude towards our environment and animals. We are the second College in University of Delhi that has ventured into establishing the Lab on Zebra Fish. The facility is currently being actively run by second year undergraduate students pursuing their research projects.

Appendix II

Establishment of state-of-the-art laboratories for Skill Enhancement

PCB Design and Fabrication Lab

'Design & Fabrication of Printed Circuit Boards' is one of the vital subjects which is offered as SEC (Skill Enhancement Course) paper in B.Sc.(H) Electronics (CBCS). Earlier, due to the non-availability of hands-on training /hardware facility to provide practical training in various aspects of designing and fabrication of Printed Circuit Boards, it was not feasible for the department to conduct/ offer this immensely important subject to its students. Availability of PCB prototyping machine has empowered the department to offer this subject as one of the SEC papers and also as a GE (general elective) paper which can be pursued by students of other departments.
Moreover, the accessibility of PCB Design and Fabrication machine in the lab has also made it very easy for the students to utilize it for their various long-term and short-term projects funded under DBT STAR College scheme.

Artificial Intelligence Lab

Artificial Intelligence, Machine Learning, Data Science and Internet of Things can be considered to be one of the most rapidly growing and exciting fields of technology right now. They have deeply penetrated into almost all the sectors of science and technology including consumer electronics, e-commerce, robotics, automation, preventive health care and medical diagnosis. This new lab will give a rigorous, advanced and professional graduate-level foundation in Artificial Intelligence and Machine Learning.

Internet of Things (IoT) Lab

This Industry 4.0 compliant lab gives the basic understanding about Internet of Things (IoT). It will train the students on the technology used to build these kinds of devices, how they communicate, how they store data, and the kinds of distributed systems needed to support them. Students will be able to integrate various components used in IoT to work on projects such as Smart Home Automation, Smart Security Solution, Smart Industrial and Agriculture solutions.

Augmenting Existing labs to carry out advanced level experiments

Establishment of Applied Physics Lab in Department of Electronics

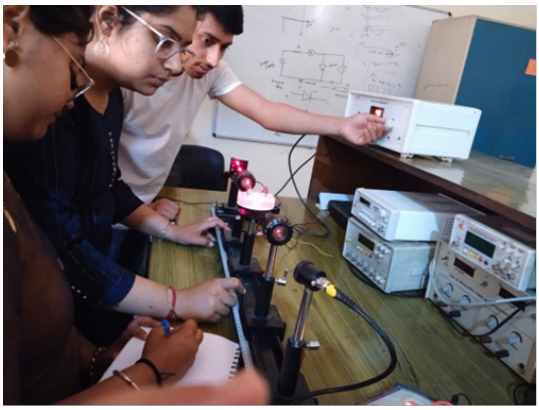
Department of Electronics has established its own Applied Physics laboratory that has facilitated the conduct of various practicals. Various supporting laboratory equipments and other required accessories have been purchased with assistance from the grant available under DBT STAR college scheme.

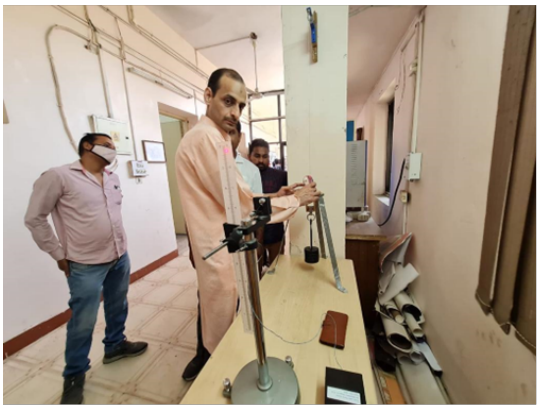
Modern Communication Systems Lab

In order to provide practical demonstration of advanced modulation techniques, many new set-ups have been instated in Communication Lab. This has enabled better awareness amongst towards modern modulation techniques which are employed in advanced communication systems. Some of the state-of –the equipments procured for carrying out experiments related to Modern Communication Systems include setup for

16 QAM Modulation and Demodulation
Architecture of Mobile phone
Satellite Communication System

In addition to these, state-of-the art lab equipments have been added to promote innovative research in some of the latest technology areas including VLSI, Robotics, 3D Printing, nano science and technology, Industrial automation through Control Lab.






Appendix III

This year College organized two International Conferences

International Conference on Mitigating Contemporary Environmental Issues by Sustainable Approaches [ICMCESA-2022]

Acharya Narendra Dev College organized an International E-Conference titled "Mitigating Contemporary Environmental Issues by Sustainable Approaches [ICMCESA-2022]. In commemoration of Science week the event spanned from February 22-28,2022. With consideration of the ongoing "Decade of Action" proclaimed by the United Nations, the main focus of the conference was to generate interest among all on the pressing environmental concerns and the urgent need to adopt sustainable approaches worldwide to protect the habitat. A theme of such pertinence, the speakers and various presenters confronted diverse 'Areas of Concern'. Adhering to Covid-19 protocols regarding travel restrictions and social distancing, this conference was conducted over the virtual platform, the event hosted speakers from USA, Slovenia, Australia, UK, Uruguay, and Czech Republic, to name a few.

6th Annual International e-Conference on International Network of Soil Contamination Research-INSCR2021 on "MICROBES IN SUSTAINABLE DEVELOPMENT"

Keeping in view about the role of microbes in sustainable development, ANDC in association with INSCR organized 6th International Conference over the virtual platform. The event hosted 30 International and 40 National speakers of international repute. Two Pre conference workshops namely, Art of scientific writing and communication, and Hands on to computational Biology, for (Meta)genomic analysis were also organized for Undergraduate, Postgraduate students and research scholars from November 14-15, 2021. An online Agar Competition was also organized that show active participation from all over the country. During the conference, undergraduate, postgraduate students, research scholars and faculty members presented their research papers.

TRINITY MIRROR

Mitigating Contemporary Environmental Issues by Sustainable Approaches

Acharya Narendra Dev College shows the way

Dr. Ravi Chaturvedi

Environmental sustainability covers a wide range of issues starting from a specific location to a global situation. Global issues comprise concerns about GHG mitigation, climate change, and renewable energy, while the location-specific issues are soil erosion, water management, soil quality, and air and water pollution.

Befittingly, giving priority to environmental issues, Acharya Narendra Dev College of University of

Environmental Issues by Sustainable Approaches".

There were a total 16 key-note speakers from all over the world who shared their innovative knowledge and application methodology with regard to environment in the conference. There were 28 invited speakers from such diverse domains - Professors, Academicians, Environmentalists, Researchers from Environmental related fields, Scientists involved in Mitigation of Environmental issues and even Legal Practitioners.

Prof. Gaytha A Langlois, a doyen in crafting municipal and statewide environmental policies, Department of Environmental Policy, Byrant University, Rhode Island, USA, was plenary speaker who graced the inaugural deliberations. She focused on the crises of misalignment of poli-

ticipants the conference also focused on pragmatic and empirical approach to the theoretical discussions. There were more than 100

nology, Govt. of India. Prof. Ravi Toteja, Principal of the College on behalf of the entire faculty and students, had some

drinking water and the pointer that road towards progress are the vision of tomorrow. Successful en-

Appendix IV

New Initiatives under DBT STAR COLLEGE SCHEME

Virtual lab at ANDC (V-Lab@ANDC)

Unnatural circumstances need innovative solutions and COVID-19 brings such situations for academics where normal offline education came to a halt. Theoretical concepts were being delivered to students online but for understanding practical concepts a hands–on approach was missing. Acharya Narendra Dev College conceptualized the idea of Virtual lab (V-Lab) to provide remote access of various labs to the undergraduate science students through the internet, and thus became the first college in the University of Delhi to start V-Lab at its campus.

Virtual lab allows the student to understand, learn and perform the practical on their own remotely with a click of the mouse. It provides a complete Learning Management System (LMS) where students can avail the various learning, including additional web-resources, video-lectures, animated demonstrations and self-evaluation. Web enabled experiments have been designed for remote operation and viewing so as to enthuse the curiosity and innovation into students. This would help them in learning basic and advanced concepts through remote experimentation.

The course structure of various labs and experiments available on V-Lab@ANDC is futuristic, following a four quadrant model for e-content, and is developed considering the National Education Policy (NEP)-2020. V-Lab@ANDC website is created and maintained by our own students for four domains i.e. Biological Science, Chemical Science, Electronics and Physical Science which include seven departments i.e. Biomedical Science, Botany, Chemistry, Computer Science, Electronics, Physics and Zoology.

Although the V-Lab@ANDC was initiated to tackle the COVID related problems in teaching and learning process but is not confined to it. Students now can perform their experiments 24 X 7, on even sophisticated and expensive instruments, multiple times and at their ease without wasting the resources and can even generate the measured data for at least a few experiments.

Through V-Lab@ANDC we are proving the ideology of our college ‘Preparing for the future’ by exploring and innovating ‘Beyond the classroom’ or rather ‘Beyond the Practical Lab’.

The lab is developed under four domains:

Biological Science: Developed by the Department of Biomedical Science, Botany and Zoology

Chemistry: Developed by the Department of Chemistry

Computer Science: Developed by the Department of Computer Science

Physical Science: Developed by the Department of Electronics and Physics

Bootcamps for V-Lab Development

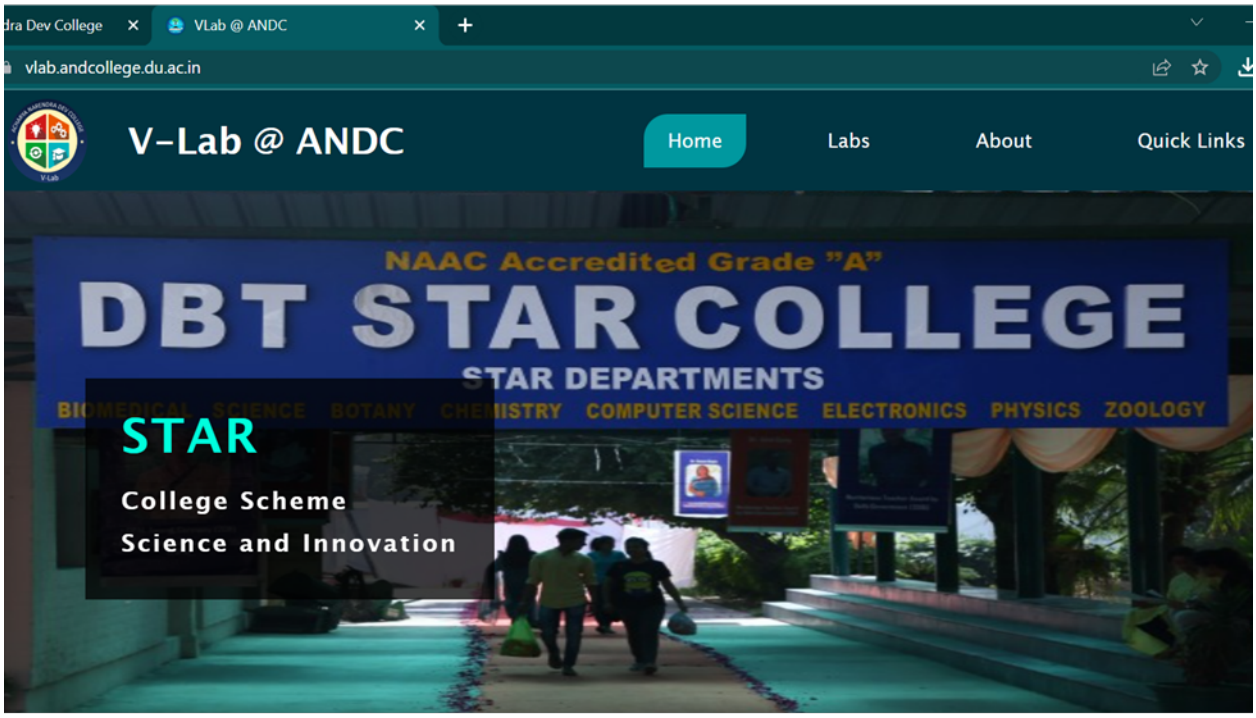
1. Bootcamp1.0 (online)

Bootcamp 1.0 was organized for the College students to train them to build digital content on web i.e. web pages. These pages will also be used for the V-Lab experiment’s content page.

JavaScript- Basic Introduction, Objects, Elements, Data Types, Keywords, Looping Constructs, Functions, Animations using Event Listeners

2. Bootcamp 2.0 (offline)

Bootcamp 2.0 was a level II workshop for the students who developed interest in V-Lab development. This workshop was held in offline mode in the Web Centre. The Workshop was attended by more than 30 students from various departments of the college.


VLab @ ANDC
vlab.andcollege.du.ac.in
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NAAC Accredited Grade "A"
DBT STAR COLLEGE
STAR DEPARTMENTS
BIOMEDICAL SCIENCE BOTANY CHEMISTRY COMPUTER SCIENCE ELECTRONICS PHYSICS ZOOLOGY
STAR
College Scheme
Science and Innovation


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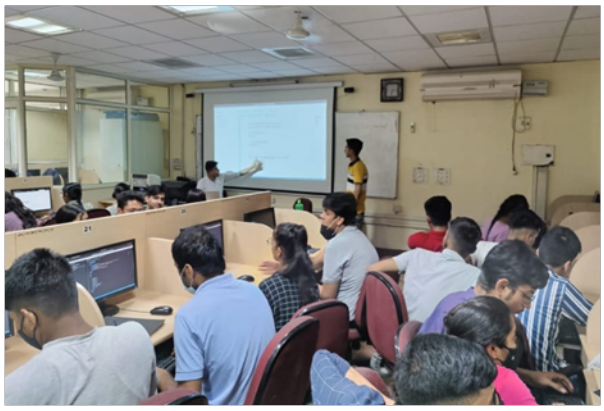

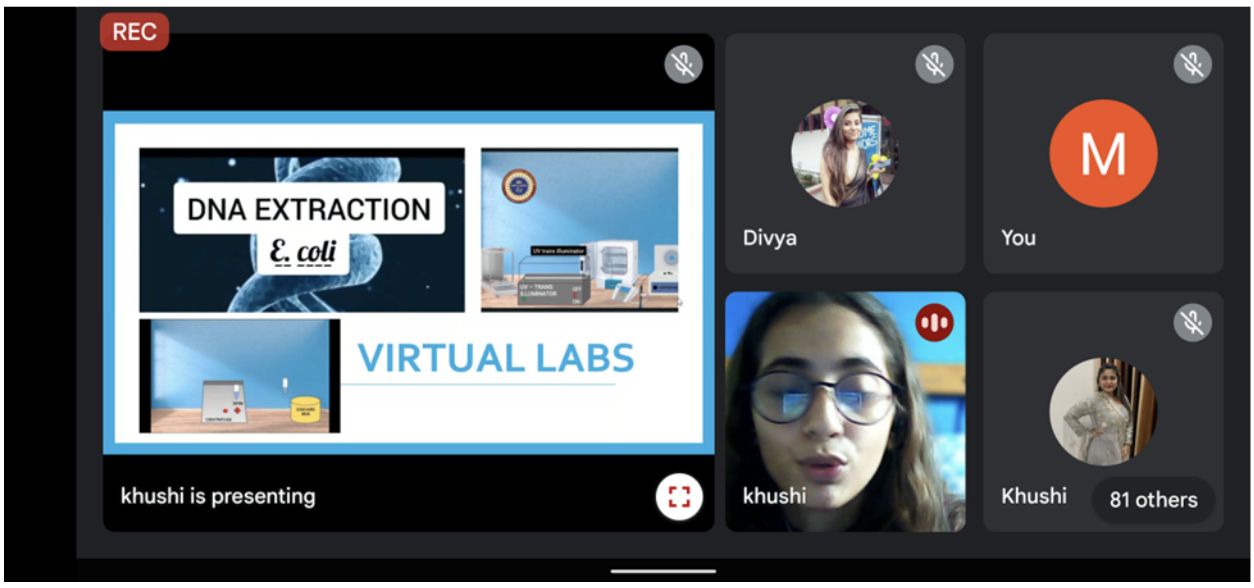
REC
DNA EXTRACTION
E. coli
VIRTUAL LABS
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Divya
M
You
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Khushi
81 others

List of Experiments Created in the Virtual Lab by the College Students

S.No.	Name of the Experiment	Animation/Simulator created by	Mentor/s
1	Domain: Biological Science		
2	Plastic Impressions of Footprint	Ayush Mishra Vaibhav Thapliyal B.Sc. (H) Physics, II Year Kalyani Kumari B.Sc. (H) Biomedical Science, III Year	Dr Archana Pandey Dr Ritu Khosla (Biomedical Science)
3	Quantification of Unknown DNA	Ramganesh Pandey Vridhi Singh Mohd. Afham B.Sc. (H) Botany, II Year Ayush Mishra Vaibhav Thapliyal B.Sc. (H) Physics, II Year	Dr SumitSahni Dr Vineet K Singh (Botany)
4	Gram Staining	Ayush Mishra Vaibhav Thapliyal B.Sc. (H) Physics, II Year	
5	pH of Soil Samples		
6	Isolation of genomic DNA from E.coli	Avnija Tyagi Ritika Chandel Sejal Arora B.Sc. (H) Zoology, III Year Ayush Mishra Vaibhav Thapliyal B.Sc. (H) Physics, II Year	Prof. Ravi Toteja Prof. Sarita Kumar Prof. Seema Makhija Dr Rahul Dev Mr Sanjay (Zoology)
7	Isolation of plasmid DNA from E.coli	Avnija Tyagi Ritika Chandel Sejal Arora B.Sc. (H) Zoology, IIYear Ayush Mishra Vaibhav Thapliyal B.Sc. (H) Physics, II Year	Prof. Ravi Toteja Prof. Seema Makhija (Zoology)
8	Height-Weight Experiment	Ayush Mishra Vaibhav Thapliyal B.Sc. (H) Physics, II Year	
	Domain: Chemical Science		
10	Redox Titrations	Ayush Mishra Vaibhav Thapliyal B.Sc. (H) Physics, II Year	Dr Manisha Jain Dr NeetiMisra (Chemistry)
	Domain: Computer Science		
11	DataFrames-3 simulators	Ayush Mishra Vaibhav Thapliyal B.Sc. (H) Physics, II Year Sakshi Garg Aliya Vivek Sankhyan Pankaj Sahu Palak Sharma B.Sc. (Prog.) Physical Science (Computer science), II Year	Prof. SharanjitKaur Ms Gunjan Rani (Computer Science)
12	Prime Numbers	Ayush Mishra Vaibhav Thapliyal B.Sc. (H) Physics, II Year Nilesh Pandey Amiteshsingh Ananya Shukla Siya Agarwal Harsh Bamotra Shahnawaz khan B.Sc. (H) Computer Science, II Year	Prof. SharanjitKaur MsNishu (Computer Science)
13	Bubble Sorting		

	Domain: Physical Science		
14	Law of Malus	Ayush Mishra Vaibhav Thapliyal B. Sc. (H) Physics, II Year	Dr Ravneet Kaur (Electronics)
15	Boltzman'sConstan		
16	Low pass Filter using OP-AMP		
17	V-I characteristics of Zener Diode		
18	Monte-Carlo Estimation of Pi	Ayush Mishra Vaibhav Thapliyal B.Sc. (H) Physics, II Year	Dr. Sanjeeta Rani (Physics)
19	Bisection Method for finding roots of polynomials		
20	Newton-Raphson Method for finding roots of equations		
21	Secant Method for finding roots of polynomials		
22	Iterative Method for finding roots of polynomials		
23	Trapezoidal Rule for definite integral		
24	Simpson's 1/3 Rule for definite Integral		
25	Eulers Method for Ordinary Differential Equation		
26	ModiefiedEulers Method for Ordinary Differential Equation		

Virtual Videos Created by Students of ANDC

S.No.	Title of Video	Contributor (Department)	URL
1	Mitosis Animation	MsSanskriti Ms Anju Ms Ritika B.Sc (H) Zoology, II Year	https://youtu.be/Zr4tx5eY3YM
2	Cell Types in Blood	Me Junaid Ms Sneha MsShreyansh MsManshi Ms Shruti B.Sc (H) Zoology, II Year	https://youtu.be/Zr4tx5eY3YM
3	Mitosis	MsSanskriti Ms Anju Ms Ritika B.Sc (H) Zoology, II Year	https://youtu.be/dsq0nIgZQLU
4	Blood Group Determination	Mr Junaid Ms Sneha MsShreyansh MsManshi Ms Shruti B.Sc (H) Zoology, II Year	https://youtu.be/s7fGvHanxjI
5	To determine the dissolved oxygen in a water sample by Winkler's Method	Ms Swati Maurya Ms Jyoti Dagar Mr Sandeep Antil Prof. Ravi Toteja Prof. Seema Makhija	https://www.youtube.com/watch?v=5S_JVZs312s&t=48s
6	Cytochemical demonstration of DNA by Feulgen	Ms Swati Maurya Ms Jyoti Dagar Mr Sandeep Antil Prof. Ravi Toteja Prof. Seema Makhija	https://youtu.be/-gXrKXQMPIg

Live Videos Created by Faculty of ANDC

S.No.	Title of Video	URL
Prof. Ravi Toteja, Prof. Seema Makhija, Mr Sanjay Kumar		
1	Meiosis: Practical Class	https://www.youtube.com/watch?v=8VCnakFV4V8
Prof. Arijit Chowdhuri		
2	Cathode Ray Oscilloscope-1	https://www.youtube.com/watch?v=kKo81VrkJVY&list=PLNsppmbLKJ8L5-b3dqLXnhrn-z3UsAKel
3	Cathode Ray Oscilloscope- 2	https://www.youtube.com/watch?v=c77Zph_Yg6k&list=PLNsppmbLKJ8L5-b3dqLXnhrn-z3UsAKel&index=3
4	Logic Gates	https://www.youtube.com/watch?v=N_lZifiixSo&list=PLNsppmbLKJ8L5-b3dqLXnhrn-z3UsAKel&index=5
5	Digital Systems: Gates and Applications – 1	https://www.youtube.com/watch?v=ZrLEe3m7sKg&list=PLNsppmbLKJ8L5-b3dqLXnhrn-z3UsAKel&index=6
6	Digital Systems: Gates and Applications – 2	https://www.youtube.com/watch?v=qbWfZ5-Ir5I&list=PLNsppmbLKJ8L5-b3dqLXnhrn-z3UsAKel&index=7
7	Energy Conservation and Harvesting – 1	https://www.youtube.com/watch?v=U0yvGlyZY5w&t=283s
8	Energy Conservation and Harvesting – 2	https://www.youtube.com/watch?v=3VeE-Oxr4vE&list=PLNsppmbLKJ8L5-b3dqLXnhrn-z3UsAKel&index=9
9	Multiplexers – 1	https://www.youtube.com/watch?v=k_W2Ffcz86E
10	Multiplexers – 2	https://www.youtube.com/watch?v=uhCui6hb9BA
11	Flip Flops – 1	https://www.youtube.com/watch?v=UZI-z2HJMfw&list=PLNsppmbLKJ8KeEIxy81OlC-AGIWJAG8gL
12	Flip Flops – 2	https://www.youtube.com/watch?v=aHrL4aakHaM&list=RDCMUCA7OQkX9AEIVQ6j9i0OSQhA&index=4
13	Shift Registers – 1	https://www.youtube.com/watch?v=HbYfMWGKsYU&list=RDCMUCA7OQkX9AEIVQ6j9i0OSQhA&index=
14	Shift Registers – 2	https://www.youtube.com/watch?v=50iAC2_GO0Y&list=PLNsppmbLKJ8KeEIxy81OlC-AGIWJAG8gL
Dr Manisha Jain		
15	Study of pH dependence of UV-Vis spectra of aqueous potassium dichromate solution	https://youtu.be/XCf6IZq4XEE
16	Preparation of Tetraaminecopper(II) sulphate monohydrate	https://youtu.be/TWYu4d6xj8
Dr V. Bhasker Raj		
17	Solve 1-D heat equation (PDE) using finite difference and Crank Nicolson method in SCILAB	https://www.youtube.com/watch?v=d_aCYcaGMPY
18	Solve boundary value problems (linear differential equations) using Shooting method in SCILAB	https://www.youtube.com/watch?v=oEJe4MYyU2U
19	Solve ODE (Dirichlet and mixed boundary) using Finite difference method in SCILAB	https://www.youtube.com/watch?v=Z2_UgvFAWxw&t=117s
20	Solve ODE (1st and 2nd order) using Euler's & modified Euler's method in SCILAB	https://www.youtube.com/watch?v=A_9Wf0S-H5U&t=1s
21	Solve system of linear equations using Gauss Elimination method in SCILAB	https://www.youtube.com/watch?v=qH1YhJjo1Ck&t=2s
22	Solve a system of linear equations using Gauss Seidel method in SCILAB	https://www.youtube.com/watch?v=dMMyphNLk4M
23	Numerical Integration using Trapezoidal & Simpson's rule (1/3 and 3/8) in SCILAB	https://www.youtube.com/watch?v=bHPqzurmI7w&t=1s
24	Interpolation using Newton's Forward and Backward difference formula in SCILAB	https://www.youtube.com/watch?v=lB8C9DZic9U
25	Introduction to SCILAB for beginners (part-2)	https://www.youtube.com/watch?v=CKdaC6BmiIM&t=7s
26	Introduction to SCILAB for beginners (part-1)	https://www.youtube.com/watch?v=bHVOPECO8-o&t=5s
27	Molecular Dynamics simulation (NVT) (full code in SCILAB) via Lennard Jones potential: Part-2	https://www.youtube.com/watch?v=L4eJei4JsVU
28	Molecular Dynamics simulation (full code in SCILAB) via Lennard Jones potential: Part-1	https://www.youtube.com/watch?v=qhagrbwP84E&t=105s

Appendix V

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	Detail of Student/s with courses
1	To investigate the conditions which promote lysogeny intemperate mycobacteriophages	Prof. Urmi Bajpai (Biomedical Science)	Anirudh Kumar Srishti Singh B.Sc. (H) Biomedical Science, II Year
2	To check whether virus/phages undergo lysogeny based on Virus-Virus interaction only		Mehak Sharma B.Sc. (H) Biomedical Science, II Year
3	Purification and characterization of lysins from mycobacteriophages.		Pulkit Singh B.Sc. (H) Zoology, II Year
4	Bacteriophage encoded lysins:Nature'sEnzybiotics (Enzyme as antibiotics)		Shivam B.Sc. (H) Biomedical Science, II Year
5	Tumor Suppressor Genes v/s Body Mass and Longevity	Dr Sunita Jetly Dr Ritu Khosla (Biomedical Science)	Yash Goel Sharika Mattoo B.Sc. (H) Biomedical Science, II Year
6	Synthesis of various Nanoparticles by using extracts from medicinal plants, their characterization and assessment of antimicrobial properties	Prof. Gagan Dhawan Dr Satendra Singh (Biomedical Science) Prof. Seema Gupta (Chemistry)	Suravi Riya Alshad Gaurav Hiya Tabish Kalyani Nidhi Harshelle Tanushree Deeparati, HarinandnaKrishna Kapil B.Sc. (H) Biomedical Science II Year and B.Sc. (H) Chemistry, II Year
7	Genetic predisposition to Hepatocellular carcinoma and possible prognosis and treatment strategies	Dr Archna Pandey Dr Ritu Khosla (Biomedical Science)	Bisakha Das PritikaKwatra B.Sc. (H) Biomedical Science, III Year
8	Utilization of lignocellulosic waste in cultivation ofPleurotusdjamor var. roseus(Pink oyster mushroom) and recovery of enzymes from spent mushroom substrate.	Dr Anupama Shukla Dr Anita Narang (Botany)	Riya Dayal Lalit Pal Maniket Chauhan Kanchan PrathamSingh Chauhan Shreya Singh B.Sc. (H) Botany, II Year
9	Collection, isolation, characterization and cultivation of different mushrooms	Dr Anupama Shukla Dr Anita Narang Dr SumitSahni Dr Manoj Kumar Singh (Botany)	Vridhi Singh Shubhanshu Krishna Mohd. Afham Kanchan Seema Akanksha B.Sc. (H) Botany, III Year

10	Mitigating Air pollution through Phylloremediation	Prof. Charu Khosla Gupta (Botany)	Jay Kumar Sirmoria Sruthi S. Kumar Aishwarya Kumar Chaturvedi B.Sc. (H) Botany, II Year
11	Climate Change and Plant-pollinator relationship		Mridula Rani Mayank Yadav B.Sc. (H) Botany, II Year
12	Study of effect of air pollutants on soil microbiome	Prof. Charu Khosla Gupta Dr Yash Mangla (Botany)	Nikhil Sharma Sahil Chauhan B.Sc. (Prog.) Life Science, II Year
13	ROS regulation during stages of seed germination owing to temperature stress in Sunflower seedling	Dr Anita Thakur Dr Geetika Kalra (Botany)	Arunima Dey Devanshi Saini Deepanshu Kumar Vibha Shukla B.Sc. (Prog.) Life Science, II Year
14	Cultivation of Pleurotuseryngii (king oyster mushroom) on lignocellulosic waste and characterization of enzymes from spent mushroom substrate	Dr SumitSahni Dr Anupama Shukla (Botany)	MrMohd. Afham B.Sc. (H) Botany, II year
15	Cultivation of Pleurotuseryngii (king oyster mushroom) on lignocellulosic waste and characterization of enzymes from spent mushroom substrate	Dr SumitSahni Dr Manoj Kumar Singh (Botany)	MsVridhi Singh B.Sc. (H) Botany, II Year
16	Utilization of Lignocellulosic waste in cultivation of Pleurotusostreatus (Blue Oyster Mushroom) and recovery of enzymes from spent mushroom substrate	Dr SumitSahni (Botany)	MrMrityunjoy Chakraborty B.Sc. (H) Botany, II Year
17	Utilization of Lignocellulosic waste in cultivation of Pleurotusostreatus (Blue Oyster Mushroom) and recovery of enzymes from spent mushroom substrate		Mr. Shubhanshu Krishna B.Sc. (H) Botany, II year
18	Synthesis of Fe3O4 nanoparticles through sonication and its effects	Prof. Sunita Hooda Prof.Geetu Gambhir (Chemistry)	Puneet Chauhan AkshitJauhri Soven K. Samal B.Sc. (Prog.) Life Science, I Year
19	Investigative study of groundnut husk for the adsorptive removal of dyes from aqueous solution.		Geni Yao Eniya Tapo B.Sc. (Prog.) Life Science, III Year
20	Adsorption of organic dye by magnetized Graphene oxide, Ground nut husk, Guar gum from Aqueous Solution.		Yashank Chauhan Akshat Bhanu Dharmani B.Sc. (Prog.) Life Science, III Year
21	Synthesis of nanoparticles of Polyvinyl Alcohol by CO-Precipitation method		Kapil Sharma Khushi Vishwakarma Vishwa Deepak Srivastava B.Sc. (Prog.) Life Science, I Year
22	Synthesis of magnetic nanoparticles and UV-Visible analysis		Abhijit Roy Bipasa Arya B.Sc. (Prog.) Life Science, I Year
23	Synthesis and Biological Activity of Chalcones	Prof. Rashmi Thukral (Chemistry)	Aashi Yukta Aditi Heena B.Sc. (Prog.) Life Science, II Year
24	Extraction of essential oils by Green methods	Dr Manisha Jain (Chemistry)	Anjali B.Sc.(H)Chemistry, II year

25	Computational Studies on some Inorganic Compounds Using Avogadro and Gaussian Softwares	Dr Manisha Jain Dr NeetiMisra (Chemistry)	Aditi Kandari Somya Singh B.Sc.(H)Chemistry, II year
26	Review on synthesis of Heterocyclic compounds and extraction of medicinal plants	Prof. Pankaj Khanna DrNeeti Mishra DrKavita Mittal (Chemistry)	Jai Gautam B.Sc. (Prog.) Physical Science, II Year Shweta B.Sc. (H) Chemistry, II Year
27	Use of catalysts for synthesis of biologically active heterocyclic compounds	Dr Kavita Mittal (Chemistry)	Shweta B.Sc.(H)Chemistry, II Year
28	Magnetite Graphene Oxide/Chitin Nanocomposites as Ion Sensors from Aqueous Systems: A DFT Study	Dr Pragati Malik (Chemistry)	Arnav Bhatt SachinRao B.Sc. (Prog.) Life Science, II Year
29	Analyzing the effect of crime in India over Female foreign tourists	Prof. SharanjitKaur (Computer Science)	Suruchi Verma TishyaThukral B.Sc. (H) Computer Science, III Year
30	Exploring machine learning models for ransomware data		Nirmal Mor Sushant B.Sc. (Prog.) Physical Science (Chemistry), II Year
31	Implementing four virtual labs (computer Science computer simulations) https://www.vlab.andcollege.du.ac.in/	Prof. SharanjitKaur Dr Gunjan Rani Dr Nishu Singh Dr Vandita (ComputerScience)	Nilesh Pandey Amitesh Ananya Shukla Siya Agarwal Harsh Bamotra Shahnawaz khan B.Sc. (H) Computer Science, II Year Sakshi Garg Aliya Vivek Sankhyan Pankaj Sahu Palak Sharma B.Sc. (Prog.) Physical Science (Chemistry), II Year
32	Disaster management to combat Covid-19	DrHarita Ahuja, Dr Sunita Narang (Computer Science)	Sant Anandita Abhishek B.Sc. (H) Computer Science, III Year
33	Data Analysis and Visualization of Rainfall and floods in India		Deepanshu MeghaKarki Shruti Jain B.Sc. (H) Computer Science, III Year
34	College Resource and Space Utilization App	Mr Mahesh Kumar (Computer Science)	Jyotika Sharma Rishabh Sharma Tanisha Sharma B.Sc.(H)Computer Science, II Year
35	Issues, Challenges, and Growth of e-Learning during Covid-19 pandemic	MsNishu Singh Mr Mahesh Kumar (Computer Science)	Tanu G Anam Khan Jyotika Sharma Tanisha Sharma B.Sc.(H)Computer Science, II Year
36	Visualizing your data of music app	Ms Gunjan Rani Mr Mahesh Kumar (Computer Science)	Somesh Abhishek Akanccha B.Sc. (Prog.) Physical Science (Chemistry), II Year
37	Alumni Database Handling	Ms Gunjan Rani (Computer Science)	Harsh Bamotra Pratham Sharma B.Sc.(H)Computer Science, II Year Palak Sharma B.Sc. (Prog.) Physical Science (Chemistry), II Year

38	Faculty Database Handling		Shahnwaz Khan Pankaj Sahu Garvit Dubey B.Sc.(H)ComputerScience, II Year
39	Text to Speech Converter		Vivek Sharma Aliya Sakshi Garg B.Sc. (Prog.) Physical Science (Chemistry), II Year
40	V-Labs		Nilesh Pandey Sahiba Siya Agarwal B.Sc.(H)Computer Science, II Year
41	Library Book Reminder		Vivek Sharma Aliya Sakshi Garg B.Sc. (Prog.) Physical Science (Chemistry), II Year
42	Designing of a first order Low-pass and High-pass filter using op-amp (Virtual Lab Development)	Dr Ravneet Kaur Ms Gauri Ghai (Electronics)	Ankush Rana B.Sc. (H) Electronics, II Year Vishal Gupta B.Sc. (H) Electronics, I Year
43	Study of the I-V characteristics of the Common Base configuration of BJT and obtain ri, ro, α. (Virtual Lab Development)		Anubhav Singh Alok Singh B.Sc. (H) Electronics, II Year
44	To design JK Master Slave using elementary gates (Virtual Lab Development)		Akash Jha B.Sc. (H) Electronics, II Year Muskan Kumar Sharma B.Sc. (H) Electronics, I Year
45	To verify Malus law		Swati Shukla B.Sc. (H) Electronics, II Year Sneha B.Sc. (H) Electronics, I Year
46	To determine the value of Boltzmann constant by study the forward characteristics of diode.		Naman Prasad B.Sc. (H) Electronics, II Year
47	To determine Young's modulus, Modulus of rigidity and Poisson's ratio for the material of a wire by Searle's method with the help of Vlab.	Dr Sanjeeta Rani Dr V Bhaskar Raj Dr Satya Prakash Dr Neelakshi Borah (Physics)	Neha Khanra Nisha Khanra B.Sc. (H) Physics,I Year
48	Automated and upgraded machine as replacement of noncontact thermometer used for COVID-19 detection for entry in public spaces such as metro stations, parks etc.	Prof. Arijit Chowdhuri Dr V. Bhasker Raj (Physics)	Pratham Malik B.Sc. (Prog.) Physical Science (Electronics), II Year Niharika Upadhyay B.Sc. (H) Biomedical Science, III Year
49	Environmental and gas sensing applications of Quartz Crystal Microbalance (QCM)		Kalpajit Roy Prahlad Sharma Varnika Aggarwal B.Sc. (H) Physics,II Year
50	Investigating the factors influencing generation and effects of Eddy currents	Prof. Arijit Chowdhuri (Physics) Prof. Seema Makhija (Zoology)	Rati Chaturvedi B.Sc. (H) Zoology, I Year
51	Gas Leakage Detector using Arduino and GSM Module with SMS Alert and Sound Alarm	Dr V. Bhasker Raj (Physics)	Prashant Verma B.Sc.(H) Physics, II Year
52	Mutations in SARC-COV 2	Prof. Sarita Kumar (Zoology)	Anshika Sharma B.Sc. (H) Zoology, I Year

53	Effect of Chitin Synthesis Inhibitors on the growth and biochemical parameters of insect pests of agricultural importance		Gunjan Grover B.Sc. (H) Zoology, II Year Anaam Asif Moin Charu Jaiswal Khushi Aggarwal Khushi Vashishtha Twishi Mishra Kanishka Bothra Divya Yadav Shruti Kumari Singh Preeti Singh Sanskriti B.Sc. (H) Zoology, I Year
54	Biological Importance of heterocyclicCompound	Prof. Ravi Toteja Prof. SeemaMakhija (Zoology) Dr Pooja Bhagat (Chemistry)	Swati Maheshwari Ujjwal Kumar Gupta Radhika Garg B.Sc. (H) Zoology, II Year
55	Bioindicators to assess the soil quality of AND College	Prof. Ravi Toteja Prof. SeemaMakhija Dr Rahul Dev (Zoology) Dr Pooja Bhagat (Chemistry)	Meghana Bisht Tanya Chopra Ayushi Gupta B.Sc. (H) Chemistry, II Year
56	Creation of animation and simulator for Virtual Laboratory of Zoology practicals	Prof. Ravi Toteja Prof. SeemaMakhija Dr Rahul Dev (Zoology)	Avnija Tyagi Ritika Chandel Sejal Arora B.Sc. (H) Zoology, III Year HarshitaBasab B.Sc. (H) Zoology, I Year

Appendix VI

Awards/ Accolades/Publications of students

Awards/Accolades

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
1	Meghana	B.Sc. (H) Chemistry, I Year
2	Tanya Chopra	B.Sc. (H) Chemistry, I Year
3	Anushka Jain	B. Sc. (H) Computer Science, II Year
4	Priya Singh	B. Sc. (H) Computer Science, II Year
5	Rishi Sarbobhoum	B. Sc. (H) Computer Science, II Year
6	Sant Kumar	B. Sc. (H) Computer Science, II Year
7	Suruchi Verma	B. Sc. (H) Computer Science, II Year
8	Bindu	B. Sc. (H) Physics, III Year

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

Suman, B.Sc. (H) Chemistry, II Year was awarded **POSE Scholarship** sponsored by Haryana State Council for Science, Innovation and Technology, DST, Government of Haryana.

Kartikey Tiwari, B.Sc. (Prog.) Physical Science (Computer Science), II Year was awarded **INSPIRE Scholarship** from DST, Government of India and **UP Government Scholarship,**

Sudeepta Singh of B.Sc.(H) Biomedical Science, VI sem secured first merit position in University of Delhi.

Ramesh Niraula, Tejaswini of B.Sc. (H) Biomedical Science, VI sem was First Runner-up of Bio-Enterpreneurship Competition held by Netaji Subhas University of Technology. 2021.

Kalpajit Roy and Varnika Agarwal from B.Sc. (H) Physics, II Year were finalists at international research competition, Phoenix Space Launchpad Challenge, organized by Phoenix Space education Ltd.

UG Student Publications

1. Das, R., Kotra, K., Singh, P., Loh, B., Leptihn, S., & Bajpai, U. (2021). Alternative Treatment Strategies for Secondary Bacterial and Fungal Infections Associated with COVID-19. Infectious diseases and therapy, 1-25.

2. S. Pasricha, K. Mittal, P. Gahlot, H. Kaur, N. Avasthi and Shweta, (2022) Multicomponent Synthetic Strategies and Perspectives for Synthesis of Linked or Fused Coumarin Heterocycles: A review, J. Iranian Chemical Society, (accepted), doi.org/ 10.1007/s13738-022-02603-x.

3. Gauri Ghai, Ritesh Raj, RavneetKaur (2022) An Inclusive Science Laboratory for Visually Impaired Students, Journal of Engineering Education and Transformations (in Press).

4. Sangeeta Srivastava, Ashwani Varshney, Supriya Katyal, Ravneet Kaur and Vibha Gaur (2021) A smart learning assistance tool for inclusive education DOI:10.3233/JIFS-210075. Journal of Intelligent & Fuzzy Systems.

Infect Dis Ther
https://doi.org/10.1007/s40121-021-00559-8

REVIEW

Alternative Treatment Strategies for Secondary Bacterial and Fungal Infections Associated with COVID-19

Ritam Das · Komal Kotra · Pulkit Singh · Belinda Loh · Sebastian Leptihn · Urmi Bajpai

Symbiosis (2021) 84:295–310
https://doi.org/10.1007/s13199-021-00761-9

Unraveling the AM fungal community for understanding its ecosystem resilience to changed climate in agroecosystems

Dipanti Chourasiya[1,2] · Manju M. Gupta[3] · Sumit Sahni[4] · Fritz Oehl[5] · Richa Agnihotri[1] · Reena Buade[2] · Hemant S Maheshwari[1] · Anil Prakash[2] · Mahaveer P Sharma[1]

Received: 5 January 2021 /Accepted: 26 February 2021 / Published online: 8 March 2021

Abstract
The changing global climate affects the agroecosystem making it challenging to achieve the world's sustainable development goals. Among the facets of belowground microbial communities, the arbuscular mycorrhizal fungi (AMF) play an important place. They represent the most common symbiont phylum colonizing more than 80% of the plant families likely to be affected by global climate change. These fungi facilitate plant's mineral acquisition, improving soil structure, protecting them from biotic and abiotic stresses. The elevated carbon dioxide (eCO_2) level, temperature, increased nitrogen and phosphorus deposition influences the plant phenology and AMF functioning through changes in diversity

Dalton Transactions

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Al_2O_3/CuI/PANI nanocomposite catalyzed green synthesis of biologically active 2-substituted benzimidazole derivatives†

Sahil Kohli,[a,b] Garima Rathee,[a] Sunita Hooda*[b] and Ramesh Chandra[*a]

This work is generally focused on the synthesis of an efficient, reusable and novel heterogeneous Al_2O_3/CuI/PANI nanocatalyst, which has been well synthesized by a simple self-assembly approach where aniline is oxidized into PANI and aniline in the presence of KI also acts as a reductant. The nanocatalyst was well characterized by XRD, FTIR, SEM, EDX, TEM, BET and XPS techniques. In this study, the fabricated material was employed for the catalytic one-pot synthesis of 2-substituted benzimidazoles *via* conden-

IEEE TRANSACTIONS ON NETWORK SCIENCE AND ENGINEERING

Coupling Fear and Contagion for Modeling Epidemic Dynamics

Kirti Jain, Vasudha Bhatnagar, Sadanand Prasad, and Sharanjit Kaur

***Abstract*—The emotion of fear related to an infectious disease not only influences an individual's behavior but also transmits to social contacts. Therefore, modeling human behavior is a precursor to reliable estimates of epidemic size and duration. In this paper, we present an abstract model of fear, which is realized using an Individual-based Fear Model (IBFM). In this model, fear is coupled with contagion to study the influence of human behavior on epidemic dynamics. Since fear is an inherent characteristic of an individual that determines susceptibility to infection, the model discerns between individuals by maintaining a *fear-index*. Variations in innate fear levels in populations with cultural differences are also accommodated. Since the fear level of individuals is affected by the changing size of the epidemic,** individual practices,[1] which in turn spread analogou spread of the disease itself. Therefore, study of the between disease spread and behavior has drawn intere mathematical epidemiologists [1], [4]–[7], [8]. Beds emphasize the need for developing infectious disease that better integrate social and behavioral dynamics [2

Since behavior is functionally linked with the sprea ease, study of variations in population behavior is rel predicting epidemic variables. COVID-19 pande invigorated research interest in developing models sider human behavior as an antecedent of epidemic

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DOI: 10.1002/est2.342

SPECIAL ISSUE ARTICLE

ENERGY STORAGE WILEY

Studies on energy storage properties of BFO/WO_3 bilayer thin film capacitor

Shiva Lamichhane[1] | **Savita Sharma**[2] | **Monika Tomar**[3] | **Arijit Chowdhuri**[4]

[1]Department of Physics and Astrophysics, University of Delhi, Delhi, India
[2]Physics Department, Kalindi College, University of Delhi, Delhi, India
[3]Department of Physics, Miranda House, University of Delhi, Delhi, India

Abstract
Present work reports the growth of BFO/WO_3 bilayer thin film structures over Silicon, corning and ITO coated glass substrates. BFO layer in BFO/WO_3 bilayer structure was deposited using Pulsed Laser deposition (PLD) technique at optimized laser energy (200 mJ) while WO_3 nanostructured layer was depos-

Varying Sonication Conditions to Tailor Surface Morphology of GO Thin Films for Enhanced Gas Sensing Performance

Vishal Dhingra[1,3], Shani Kumar[1,3], Arijit Chowdhuri[2] and Amit Garg[1, a)]

[1]*Material Science Laboratory,* [2]*Sensing Material Devices Laboratory*
Acharya Narendra Dev College, University of Delhi, Kalkaji, New Delhi-110019, INDIA
[3]*Department of Electronic Science, University of Delhi, South Campus, New Delhi-11002, India*
[a)]Corresponding author: amitgarg@andc.du.ac.in

Abstract. Efficient and enhanced gas sensing especially at room temperature is the demand for contemporary industri applications. This has been made possible due to a paradigm shift from semiconducting metal oxides to 2D material including Graphene Oxide (GO) and reduced GO (RGO). GO and its derivatives have ushered in a revolution mainly because of their high surface to volume ratio and presence of various oxygen groups. Literature reports since 201 indicate existence of investigations by many research groups wherein multiple approaches have been employed t enhance the gas sensing capabilities of GO and RGO. Some of the more radical approaches have been fabrication of fre

Ecotoxicology (2022) 31:271–288
https://doi.org/10.1007/s10646-021-02518-y

Molecular characterization and transcriptional modulation of stress-responsive genes under heavy metal stress in freshwater ciliate, *Euplotes aediculatus*

Sripoorna Somasundaram[1] · Jeeva Susan Abraham[1] · Swati Maurya[1] · Ravi Toteja[1] · Renu Gupta[2] · Seema Makhija[1]

Accepted: 24 December 2021 / Published online: 4 January 2022

Abstract
Heavy metal pollutants in the environment are increasing exponentially due to various anthropogenic factors including mining, industrial and agricultural wastes. Living organisms exposed to heavy metals above a certain threshold level induces deleterious effects in these organisms. To live in such severe environments, microbes have developed a range of tolerance mechanisms

7 x 10.98 in

UG student Conference Presentation

1. Poster Presentation by Swati Maheshwari, Isha Gupta, Ankit Kumar, Ujjwal Kumar Gupta, Raniya Sahoo, Radhika Garg, Rahul Dev, Ravi Toteja, Seema Makhija and Pooja Bhagat on ' Biological importance of Heterocyclic Compounds' in an International Conference of Indian Network for Soil Contamination Research (INSCR) on 'Microbes in Sustainable Development', November 15-18, 2021
2. Oral presentation by Meghana Bisht, Ayushi Gupta, Tanya Chopra, Dr Pooja Bhagat, Dr Seema Makhija and Dr Ravi Toteja on the paper titled 'Urease as a bioindicator to assess the soil quality' during international e-conference on 'Mitigating environmental issues by sustainable approaches (ICMCESA-2022)' organized by Acharya Narendra Dev College from February 22-28, 2022 under the aegis of IQAC and DBT Star College Scheme
3. Oral presentation by Jatinder Pal Singh, Kalpajit Roy, Varnika Agarwal and Prahlad Sharma in the paper titled WO3 and WO3-SnO2 composite based sensors for detection of NO2 gas' during international e-conference on 'Mitigating contemporary environmental issues by sustainable approaches (ICMCESA – 2022)' organized by Acharya Narendra Dev College from February 22 – 28, 2022 under the aegis of IQAC and DBT Star College Scheme
4. Oral presentation by Jay Kumar Sirmoria and Sruthi S. Kumar in the paper titled "A typical everyday exposure to particulate matter in the life of an undergraduate student in Delhi" during international e-conference on 'Mitigating contemporary environmental issues by sustainable approaches (ICMCESA – 2022)' organized by Acharya Narendra Dev College from February 22 – 28, 2022 under the aegis of IQAC and DBT Star College Scheme
5. Oral presentation by Shiva Lamichhane in the paper titled "Studies on photovoltaic properties of WO3/BFO bilayer thin films for solar energy harvesting applications" during international e-conference on 'Mitigating contemporary environmental issues by sustainable approaches (ICMCESA – 2022)' organized by Acharya Narendra Dev College from February 22 – 28, 2022 under the aegis of IQAC and DBT Star College Scheme
6. Oral presentation by Babita Sharma in the paper title "Electrical and optical study of ZnO thin film based UV photodetector" during international e-conference on 'Mitigating contemporary environmental issues by sustainable approaches (ICMCESA – 2022)' organized by Acharya Narendra Dev College from February 22 – 28, 2022 under the aegis of IQAC and DBT Star College Scheme.
7. Poster presented by Ms. Bindu Rajput, Ms. Rakhshanda and Ms.Naureen Ansari of B.Sc. (H) Physics III Year during the 5th International Conference on Innovative Approaches in Applied Science and Technologies on "Space Based Solar Power Satellite Models for Power Production on Mars" organized by Babasaheb Bhim Rao Ambedkar University, Lucknow from December 03-05, 2021.
8. Poster presented by Shweta, and K. Mittal in One day International Symposium "Chemical Wisdom By Her" organized by Department of Chemistry, Deshbandhu College, University of Delhi on 31st January 2022 through online mode (Topic: Emerging trends towards an efficient synthesis of pyrano[3,2-c]chromenes using diverse catalysts).

UG Students' participation

1. Ms. Bindu Rajput of B. Sc. (H) Physics, III Year Participated in a workshop for undergraduate science students on "Flavour of Research, Investigative Projects in Multidisciplinary Contexts" organized by D S Kothari Center for research and innovation in science education, Miranda House, University of Delhi.
2. Mr. Soumya Srivastav of B.Sc. (H) Physics – 1st year acted as Resource person at a 6 day boot camp entitled "Virtual Lab Development 1.0", organized by Acharya Narendra Dev College, University of Delhi from January 17 – 22, 2022.
3. Mr. Ayush Mishra and Mr. Vaibhav ThapliyalMr. Soumya Srivastav of B.Sc. (H) Physics – 3rd year acted as Resource persons at a 6 day boot camp entitled "Virtual Lab Development 2.0", organized by Acharya Narendra Dev College, University of Delhi from June 27-July 01, 2022.
4. Ms. Neha Khanra and Ms. Nisha Khanra of B.Sc. (H) Physics – 1st year attended the following a) "Indian Young Physicists League (IYPL talks' 22)" under the association of Indian Physics Students (AIPS), b) "Full stack web development using MERN" organized by Brain Mentors and c) Participated in a national level inter-college science quiz organized by IISER Pune.
5. Abhishek Pandey of B.Sc(H) Electronics I year, attended a session on "Budget par charcha" hosted by Mr. Subhash Chandra Garg , organised by COMMPACT, the commerce society of Maharaja Agrasen Institute of Management studies on February 3, 2022.
6. Naman Prasad of B.Sc(H) Electronics II year attended Intercollege Virtual Workshop on Optimization of Feedback Control System using PID Controller, organised by Bhaskaracharya College of Applied Sciences (University of Delhi), Department of Instrumentation and Department of Electronics in association with the Romtek held on 13 July 2021.
7. Naman Prasad of B.Sc(H) Electronics II year successfully completed five days online workshop entitled "Data Analysis and Visualization of Covid-19 Data using Python" organized by the Department of Computer Science, Acharya Narendra Dev College, University of Delhi, under the aegis of DBT STAR College Scheme, from June 22-26, 2021.

Appendix VII

No. of new experiments introduced

Biomedical Science

a. Preparation of Barr bodies
b. To perform Widal and Typhidot test for typhoid detection.
c. To perform test for Acylated haemoglobin detection in diabetes
d. Comparative analysis of genomic DNA and plasmid DNA by restriction enzyme digestion and estimation of size of a DNA fragment after electrophoresis using DNA markers.
e. Recrystallization of organic compound and determination of its melting point.

Botany

a. Determination of BOD, COD, TDS and TOC of different water samples
b. Determination of coliforms in water samples using eosin methylene blue (EMB) medium
c. Hydrolysis of casein by microorganisms
d. Hydrolysis of starch by microorganisms
e. Column Chromatography of chlorophyll.
f. Use of various softwares like MS Excel, SPSS, R-Stat, and SigmaPlot.
g. Calculate the percentage similarity between different cultivars of a species using RAPD profile. Construct a dendrogram and interpret results.
h. Estimation of organic matter content in soil samples
i. Stage of pollen dehiscence using flurochromes
j. Preparation of mushroom spawn
k. Techniques for the cultivation of Agaricus, Pleurotus and Ganoderma
l. Structure download (protein and DNA) from PDB (Textual file format- PDB and mmCIF).
m. Molecular viewer by visualization software (Ras Mol/ J mol/Swiss 3D Viewer/Pymol)
n. Translate a nucleotide sequence and select the correct reading frame of the polypeptide from the output sequences (such as, Translate tool of Expasy Predict the structure of protein from its amino acid sequence. (Phyre 2/ ModwebCPHmodel/ Swiss Model)
o. Gene prediction using GENSCAN and GLIMMER.

Chemistry

a. Introduction of Basics of Molecular Modelling, Avogadro Software & Argus Lab Software
b. Optimization of solvent system for the separation of components in Thin Layer Chromatography.
c. Determination of cell constant.
d. To study the kinetics of Iodide-persulphate reaction by Initial rate method.
e. Distribution of acetic/ benzoic acid between water and chloroform or cyclohexane.
f. Study the variation of co-efficient of viscosity with different concentration of Poly Vinyl Alcohol (PVA) and determine molar mass of PVA.
g. Write a program in BASIC to calculate the values using following equations:
Ideal gas equation

Van der Waals equation

h. Write a program in BASIC to solve simultaneous equations.

i. Write a program in BASIC to plot the graph of a particle in 1-D box.

j. Effect of temperature on the action of salivary amylase.

k. Estimation of glycine by Sorenson's formalin method.

l. 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.

m. To synthesize Ag nanoparticles and characterize by SPR peak.

n. To perform Claisen schmidt reaction using the green method.

o. To find out melting point of the given organic compound without using paraffin oil/acid bath.

p. To find out boiling point of the given organic compound without using paraffin oil/acid bath.

q. To study Properties of Complexes

r. Measurement of 10 Dq by spectrophotometric method

s. Verification of spectrochemical series.

t. Synthesis of ammine complexes of Ni(II) and its ligand exchange reactions (e.g. bidentate ligands like acetylacetone, DMG, glycine) by substitution method. verify spectrochemical series by recording UV spectra.

u. Write a program in BASIC to solve quadratic equations ax2 + bx + c = 0 with known values of a, b and c.

Computer Science

a. PCA-normal notebook (uploaded in code folder) using fetch_lfw_people data.

b. Use iris data to do the following:

i. Standardise the data

ii. Apply PCA to get first component only and plot first component wrt zero vector (along y-axis with range -2 to 2) and visualize using colors of class label.

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.

c. Exploring different time zones through python libraries.

d. Arithmetic operation in time series data: Periods and Period Arithmetic

e. Create a Data Frame with NA values

f. Create a Data Frame of Cars and Colors and use the map function to add a third column mentioning the companies of the cars.

g. Create subplots of dimensions 3X2 using both methods.

i. Plot lines on all of them of 50 random numbers.

ii. Keep the same x and y-axis.

iii. The first row lines should be red.

iv. The second-row lines should be blue.

v. The third-row lines should be green.

vi. All the lines are to be dashed.

vii. Put asterisk as marker on all lines.

h. Create a series with 3 values at indexes 2, 4, and 7.

i. Reindex the series as '0', '1', …. '9'.

ii. Backward fill the Null values with limit 2.
iii. Fill the null values in series from part a with ‘Missing’.
iv. Drop all the values in series from part c which are not ‘Missing’.

i. Create a data frame of values from 0 to 12 with 3 rows and 4 columns.

i. Name the index and columns.
ii. Create a series of even values of length 5 and add that series into the data frame

a. Columns wise
b. Row wise
c. Reindex either columns or rows to fill the missing values in both 1 and 2 with 0.
d. Sort the values of the data frame from section 1 in descending order.
j. Consider the series s1 = 8, -3, -4, 3, -4, 8, 2, 1, 2, 0

a) Rank the series with tie-breaker method as Min.
b) Rank the series with tie-breaker method as First.

k. Create a series with all the names of colors in Rainbow:

i. Change the index values as multiples of 3.
ii. Display the names of colors with an index value of more than 12.
iii. Change the index values to “Violet”, “indigo”, ……, ”Black”, and “White”.
iv. Check if there is any Null value in the series now.
v. Assign the index name colors to the NaN values.

l. Create a series from some Data Dictionary in Python.
m. Create a data frame of 10 students in your class having their Names, IDs, and Contact Numbers.

i. Add a new column University ID to the data frame.
ii. Delete the ID from the data frame.
iii. Give the row names as one, two three…..
iv. Find the values in the third row of the column ‘Name’.
v. Print all the Contact details of students.
vi. Add another column semester marks.
vii. Add another column ‘Result’ where write ‘pass’ if semester marks are above 40 out of 100 else write ‘fail’.

n. Consider the following data dictionaries.
{‘a’: 12, ‘b’: 45, ‘d’: 79, ‘b’: 13, ‘a’: 43, ‘e’: 33}
{‘b’: 23, ‘d’:90, ‘f’: 55, ‘a’: 21, ‘s’: 26, ‘d’: 78}
Now performed the following operations:

i. Make series out of those two data dictionaries.
ii. Append the two series by index.
iii. Find the Union of series one and series two.
iv. Find the difference between series one from two.
v. Compute the set intersection of the two series.
vi. Delete index 4 from both series.

o. Create a Nested Data dictionary and then create Data Frame out of it. Also, make rows the columns and columns the rows.
p. Implement Gradient Descent algorithm in the following manner: (Give it a try)

i. First take a dataset with single independent variable and find the best fit using Simple Linear Regression.

ii. Using the values of coefficients given in step a, apply gradient descent to minimize loss function and then make prediction again.
iii. Compare the best fit line of case a and b.

q. Use the KNN and Naive Bayes Classifier to classify the Emails into Spam or not Spam. Also, evaluate the accuracy of both the Models.

r. Perform splitting of dataset into Dependent and Independent variables after identifying them.

s. Download any Dataset from ML UCI repository and apply all Pre-processing Tools for:

i. Handling Missing Data
ii. Encoding Independent and Dependent Variables
iii. Splitting the Dataset into the Training and Test Set
iv. Feature Scaling

t. Perform the classification of Email spam or not using Decision Tree Classifier.

u. 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.

v. Logistic Regression Classification.

w. Decision Tree Classification.

x. 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 things: date, course name, semester, college, student name, and teacher name. All the content of footer should be aligned to right.

y. Write JavaScript to validate the form created by student in HTML practical.

z. Write JavaScript to show the usage of setInterval function using which background colour of a division keeps on changing to a random colour

aa. Implement Breadth First Search Algorithm (Artificial Intelligence Questions).

bb. Implement Depth First Search Algorithm.

cc. Implement Best First Search Algorithm.

dd. Implement A* search algorithm.

ee. Create an application for Temperature and Currency converter.

ff. Create an application to send username from one intent to another. (Explicit Intent Demo).

gg. 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.

hh. Create Models using Deterministic Finite Automata.

ii. Simulation of OS Process Life Cycle.

jj. Simulation of Order Lifecycle on your Favorite App.

kk. Simulation of Reservation of a Flight Simulation of a Fully Automatic Washing Machine.

ll. Simulation of Booking Vaccine on COWIN App.

mm. Simulation of Your favorite video game (eg Mario upto 1 level only).

nn. Simulation of Your favorite Music App (Spotify, Gaana).

oo. Simulation of College Library System : Simulation of Ordering from an Automated Canteen/Restaurant.

pp. Simulation of Amazon Delivery (assume order is booked).

qq. Simulation of Uber/Ola Cab booking.
rr. Simulation of various functions of a MicroWave Oven.
ss. Simulation of Automatic Gears in an automatic Car.
tt. Simulation of TCP connection establishment.

Electronics

a. Study of architecture of Mobile phone
b. Study of Satellite Communication System
c. New experiments and innovative projects (as per Industry 5.0 standard) to be implemented using AI builder
d. Write a programme to conduct uninformed and informed search
e. Write a programme to conduct game search.
f. Write a programme to construct a Bayesian network from given data
g. Write a programme to infer from the Bayesian network.
h. Write a programme to run value and policy iteration in a grid world.
i. Write a programme to do reinforcement learning in a grid world.
j. Familiarization with Arduino/Raspberry Pi and perform necessary software installation.
k. To interface LED/Buzzer with Arduino/Raspberry Pi and write a program to turn ON LED for 1 sec after every 2 seconds.
l. To interface Push button/Digital sensor (IR/LDR) with Arduino/Raspberry Pi and write a program to turn ON LED when push button is pressed or at sensor detection.
m. To interface DHT11 sensor with Arduino/Raspberry Pi and write a program to print temperature and humidity readings
n. To interface motor using relay with Arduino/Raspberry Pi and write a program to turn ON motor when push button is pressed. \
o. To interface OLED with Arduino/Raspberry Pi and write a program to print temperature and humidity readings on it.
p. To interface Bluetooth with Arduino/Raspberry Pi and write a program to send sensor 97 data to smartphone using Bluetooth.
q. To interface Bluetooth with Arduino/Raspberry Pi and write a program to turn LED ON/OFF when _1‘/‘0‘ is received from smartphone using Bluetooth.
r. Write a program on Arduino/Raspberry Pi to upload temperature and humidity data to thingspeak cloud.
s. Write a program on Arduino/Raspberry Pi to retrieve temperature and humidity data from thingspeak cloud.
t. To install MySQL database on Raspberry Pi and perform basic SQL queries
u. Write a program on Arduino/Raspberry Pi to publish temperature data to MQTT broker.
v. Write a program on Arduino/Raspberry Pi to subscribe to MQTT broker for temperature data and print it.
w. Write a program to create TCP server on Arduino/Raspberry Pi and respond with humidity data to TCP client when requested.
x. Write a program to create UDP server on Arduino/Raspberry Pi and respond with humidity data to UDP client when requested.
y. To study characteristics of: a. Synchro transmitter receiver, b. Synchro as an error detector
z. To study position control of DC motor

aa. To study speed control of DC motor
bb. To find characteristics of AC servo motor
cc. To study time response of type 0, 1 and 2 systems
dd. To study frequency response of first and second order systems
ee. To study time response characteristics of a second order system.
ff. To study effect of damping factor on performance of second order system
gg. To study frequency response of Lead and Lag networks\
hh. Study of P, PI and PID controller.
ii. Study of Electro-optic Effect
jj. Study of Faraday Rotation
kk. To determine Young's modulus of a wire by optical lever method.
ll. To determine e/m of electron by Bar Magnet or by Magnetic Focusing.
mm. To determine the Characteristics of resistance transducer - Strain Gauge
nn. To study the Characteristics of LDR, Photodiode, and Phototransistor: (i) Variable Illumination. (ii) Linear Displacement.
oo. Characteristics of one Solid State sensor/ Fiber optic sensor
pp. 3D Modelling of a single component.
qq. Assembly of CAD modelled Components
rr. Exercise on CAD Data Exchange
ss. Generation of .stl files.
tt. Identification of a product for Additive Manufacturing and its AM process plan.
uu. Printing of identified product on an available AM machine.
vv. Post processing of additively manufactured product.
ww. Inspection and defect analysis of the additively manufactured product.
xx. Comparison of Additively manufactured product with conventional manufactured counterpart.
yy. To verify and design AND, OR, NOT and XOR gates using NAND gates.
zz. To convert a Boolean expression into logic gate circuit and assemble it using logic gate IC's.
aaa. Design a Half and Full Adder.
bbb. Design a Half and Full Subtractor.
ccc. Design a seven segment display driver.
ddd. Design a 4 X 1 Multiplexer using gates
eee. To build a Flip- Flop Circuits using elementary gates. (RS, Clocked RS, D-type).
fff. Design a counter using D/T/JK Flip-Flop.
ggg. Design a shift register and study Serial and parallel shifting of data

Physics

a. Measurement of dielectric constant of metal using Surface Plasmon resonance (SPR) technique
b. Determination of refractive index of a dielectric layer using SPR technique.
c. Measurement of P - E hysteresis and plotting its characteristics
d. Systematic determination of wavelength of LASER by studying the diffraction pattern produced by a plane diffraction grating having different grating constants.
e. To determine the wavelength of LASER source using diffraction of single slit.
f. To determine the wavelength of LASER source using diffraction of double slits.

g. To determine angular spread of He-Ne LASER using plane diffraction grating
h. To find the polarization angle of LASER light
i. Studying the characteristics of Light Dependent Resistor (LDR)
j. Studying the characteristics of MOSFET
k. Studying the characteristics of DIAC
l. Studying the characteristics of TRIAC
m. Recording & reconstructing LASER viewable holograms
n. Recording & Reconstructing single-step rainbow holograms
o. Study of Pulse Amplitude Modulation
p. Study of Pulse Position Modulation
q. Study of Pulse Width Modulation
r. Study of Amplitude Shift Keying (ASK) Modulation and demodulation
s. Study of Frequency Shift Keying (FSK) Modulation and demodulation
t. Study of Phase Shift Keying (PSK) Modulation and demodulation
u. Generation and analysis of Time Division Multiplexing (TDM) waveforms
v. Study of characteristics of Junction Field Effect Transistors
w. Study of characteristics of Unijunction Transistors
x. Study of Hartley Oscillators
y. Study of Colpitt Oscillators
z. Study of Flipflops (SR, D, JK, JK Master-Slave)
aa. Study of Shift Registers (SISO, SIPO, PISO and PIPO configurations)
bb. Study of Counters (Asynchronous and Synchronous configurations)
cc. Experimenting with Arduino microcontrollers

Zoology

a. Culturing and observation of ciliates/bacteria.
b. DNA isolation from bacterial culture.
c. Agarose gel electrophoresis.
d. Polymerase chain reaction (PCR) using 18S rRNA primers.
e. Phylogenetic analysis using bioinformatic tools.
f. Isolation of environmental DNA from soil samples.
g. Determination of zooplankton diversity in freshwater samples.
h. Virtual experiment on antibiotic resistance/sensitivity in the curd bacteria.
i. Comic video on antibiotic resistance.
j. DNA extraction from human cheek cells and tomato: Virtual experiment.
k. DNA extraction from banana: Virtual experiment.
l. DNA extraction from onion: Virtual experiment.
m. Study of growth kinetics of Gram –ve bacteria using homemade spectrophotometer: Virtual experiment.
n. Effect of different concentrations of antibiotics on bacteria using potato slices as media: Virtual experiment.
o. Preparation of culture media: Virtual experiment.
p. Gelatin gel electrophoresis: Virtual experiment.
q. Plasmid DNA isolation: Virtual experiment.
r. Determination of effect of temperature on the activity of the enzyme lipase: Virtual experiment.

s. Preparation of buffer solutions of different pH.
t. Predicting the structure of protein using on line softwares.
u. Separation of component from a mixture of red and blue ink by paper chromatography: Virtual experiment.
v. Study the effect of temperature on the activity of salivary amylase: Virtual experiment.
w. Qualitative analysis of oils and fats.
x. Estimation of vitamin c or ascorbic acid.
y. Determination of pH and temperature in a pond ecosystem.
z. To determine the pH of different water sample: Virtual experiment.
aa. Determination of the intensity of light penetration using a secchi disc in different water samples: Virtual experiment.
bb. Comparing alkalinity of different water samples from different sources by using red cabbage as pH indicator.
cc. 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.
dd. Determination of the pH of different soil sample.
ee. Study plankton diversity in pond water by using fold scope.
ff. Study of pond water collected from different places to observe diversity in Protista using videos.
gg. Study of soil samples collected from different places to observe diversity in nematodes using videos.
hh. Pedigree analysis of human inherited traits using data.
ii. Study and verification of Hardy-weinberg law by Chi-square analysis.
jj. Study of the principle & method involved in counting of total leucocytes from blood (Life Science-3rd Semester).
kk. Study of the principle, method and physiological significance of estimating bilirubin.

Appendix VIII

Publications

Book

1. **Kumar S** (2022) Illustrated Biology – Textbook for Class XI, Sultan Chand & Sons (P) Ltd., New Delhi; 9789-390-85170-6.
2. **Kumar S** (2022)TestFit – Biology Sultan Chand & Sons (P) Ltd., New Delhi. ISBN: 978-93-90851-09-6.
3. Kaur H., **Toteja R** and **Makhija S** (2021) - Textbook of Immunology. Wiley Publishers, 9789390455607**.**
4. **Khosla, R**. (2021) Concepts in Environmental Studies, IK International Publishing House Pvt Ltd. ISBN: 9789390620456

Book Chapter

1. S. and **Bajpai U.** (2022) Bacteriophages in the Treatment of Biofilms In *Bacteriophages: Interaction, Diversity and Applications*, Nova Science Publishers, Chapter 10. ISBN 9781685078607.
2. Agrawal N., Singh I., Khanna M., **Dhawan G.,** Kumar P. and Dhawan U. (2022) Understanding the pharmacology and pharmacotherapeutics for infectious diseases" In *Nanotechnology for Infectious Diseases*, Springer-Nature Publication Singapore, 53-81. ISBN 9789811691898.
3. **Singh M. K.,Sahni S.** and **Narang A.** (2021) Impact of Climate Change on Functional AM Fungi in Rhizosphere In *Climate Change and the Microbiome, Sustenance of the Ecosphere*, Springer, 63, 397-418. ISBN 9783030768638.
4. **Singh M. K.,Sahni S.** and **Narang A.** (2021) Production of liquid Biofuels from Lignocellulosic Biomass In *Energy: Crisis, Challenges and Solutions*, John Wiley and Sons Ltd., 208-230. ISBN 9781119741558.
5. **Sahni S.**, **Singh M. K.** and **Narang A.** (2021) Sustainable Solution for Future Energy Challenges Through Microbes in *Energy: Crisis, Challenges and Solutions*, John Wiley and Sons Ltd., 231-249.ISBN 9781119741558.
6. Agnihotri A., **Sahni S.**, Sharma M. P. and Gupta M. M. (2022) Facets of AM Fungi Soil quality monitoring and control management in *Fungal diversity, ecology and control management*, Springer Singapore, 327-344. ISBN: 9789811688775.
7. Saya L**.** and **Hooda S.**(2021) Metal-Organic Frameworks (MOFs) as Versatile Detoxifiers for Chemical Warfare Agents (CWAs) In *Metal-Organic Frameworks (MOFs) as Catalysts*, Springer Singapore, 453-489. ISBN 9789811679582.
8. **Kumar S.**, Sharma A., Gautam D. and **Hooda S.** (2021) Characterization of Mesoporous Materials In *Advanced Functional Porous Materials: From Macro to Nano Scale Lengths*, Springer International Publishing, 893, 175-204. ISBN9783030853969.
9. Khanna L., Mansi and **Khanna P.** (2022) Nanocatalysis for Reduction /Hydrogenation Reactions In *Advanced Nanocatalysis for Organic Synthesis and Electroanalysis*, Bentham Books, 1, 96-113. ISBN 9789815040166.

10. Khanna L., Mansi and **Khanna P.** (2022) Graphene Based Nanomaterials as Catalyst in Reduction Reactions In *Graphene-Based Nanomaterial Catalysis*, Bentham Books, 1: 130-151. ISBN 9789815040494.
11. Meena R. K., **Arya D. K.,** Gaur A., Verma D., Singhal P., Aggarwal Y. and Saini A. (2022) Biological and Physical Applications of Silver Nanoparticles In *New Horizons in Life Science*, Vital Biotech Publication, 211-243. ISBN 9789392953002.
12. **Arya D. K.,** Verma A. and Rai G. J. (2022) The Impact of Climate Change on human health in India: An Overview In *New Horizons in Life Science*, Vital Biotech Publication, 244-250. ISBN 9789392953002.
13. Rawat D., **Kaushik B.** and Singhal R. (2021) Nanostructured inorganic–organic silica as green material for sustainable development of catalystsIn*Applications of Advanced Green Materials*, Woodhead Publishing,151-167. ISBN 9780128204849.
14. Bansal S. K. and **Rastogi A.,** Wealth Creation and Expected Pension in National Pension System, In Research Analog, 99-113. ISBN 9788195401062.
15. **Bhatia M.** (2021) Women in business and entrepreneurial roles: Get smarter with STEM In *Women entrepreneurship in India: Governance, sustainability and policy*, Routledge Taylor and Francis, 72-83, ISBN 9781003160786.
16. **Bhatia M.** (2021) Smart economics led by gender equality In *Women entrepreneurship in India: Governance, sustainability and policy*,RoutledgeTaylor and Francis, 29-37. ISBN 9781003160786.
17. Sao A.K., Singh J. P., Sharma B., Munjal S., Sharma A., Tomar M. and **Chowdhuri A.** (2022) CdS-SnO2 Nanocomposite Sensor for Room Temperature Detection of NO2 Gas In *Sensing Technology*, Springer, 283-289.ISBN 9783030988852.
18. Rahul, **Sonker R. K.**, Shukla P. K., Singh P. K., Khan Z. H. (2021) Experimental and Characterization Techniques In *Composite Materials*, CRC Press Taylor and Francis, Chapter 5. ISBN: 9781003080633.
19. Soonmin H., Paulraj I., Kumar M., **Sonker R. K.** and Nandi P. (2022) Recent Developments on the Properties of Chalcogenide Thin Films In *Chalcogenides - Preparation and Applications*, Intech open, Chapter 1. ISBN 9781803556628.
20. Gurav S. R., Waikar M. R., Rasal A. S., **Sonker R. K.**, Sonkawade R. G. (2022) Current Development and Challenges in Textile-Based Flexible Supercapacitors in *Smart and Flexible Energy Devices*, CRC Press Taylor and Francis, Chapter 29.ISBN: 9781003186755.

Publications in Scopus indexed Journals

1. Das, R., Kotra, K., Singh, P., Loh, B., Leptihn, S. and **Bajpai, U**. (2021) Alternative Treatment Strategies for Secondary Bacterial and Fungal Infections Associated with COVID-19. *Infect Dis Ther* 11(1):53-78.
2. Arora, G., Taneja, J., Bhardwaj, P., Goyal, S., Naidu, K., Yadav, S. K., Saluja, D. and **Jetly, S.** (2022) Adverse events and breakthrough infections associated with COVID-19 vaccination in the Indian population. *J Med Virol*ogy, 94(7), 3147-3154.
3. Yadav, S., Bhardwaj, P., Gupta, P., Saluja, D., **Jetly, S.** and Taneja, J. (2022) Association of gender, age, and comorbidities with COVID-19 infection in India. *Journal of Integrated Science and Technology*, 10(2), 61-66.

4. **Jetly, S.,** Bhardwaj, P., Arora, G., Saluja, D., Yadav, S. K., Naidu, K. P. and Taneja, J. (2022) Hesitancy and Acceptance of COVID-19 Vaccination Amidst the Second Wave of Pandemic in India: A General Population Study. *Asia Pac J Public Health*, 34(4), 446-449.
5. Jena, H., Ahmadi, Z., Kumar, P and **Dhawan, G.**(2022) Bioreducible polyethyleneimine core-shell nanostructures as efficient and non-toxic gene and drug delivery vectors. *Bioorganic and Medicinal Chemistry*, 69, 116886.
6. Saini, S., Agarwal, M., Pradhan, A., Pareek, S., Singh, A. K., **Dhawan, G.**, Dhawan, U and Kumar, Y. (2022) Exploring the role of framework mutations in enabling breadth of a cross-reactive antibody (CR3022) against the SARS-CoV-2 RBD and its variants of concern. *Journal of Biomolecular Structure and Dynamics*, 1-14.
7. **Dhawan, G.**, Singh, I., Dhawan, U., and Kumar, P. (2021) Synthesis and characterization of nanoselenium: A step-by-step guide for undergraduate students, *Journal of Chemical Education*, *98*(9), 2982-2989.
8. Ahmadi, Z., Jena, H., Singh, M., **Dhawan, G.**, and Kumar, P. (2021) Self-assembled biodegradable core-shell nanocomposites of amphiphilic retinoic acid-LMW bPEI conjugates exhibit enhanced transgene expression in hepatocellular carcinoma cells with inherent anticancer properties. *Journal of Pharmaceutical Science*, *110*(8), 3047-3060.
9. Yu, Y., Liu, A., **Dhawan, G.**, Mei, H., Zhang, W., Izawa, K., Soloshonok, V. A., and Han, J. (2021) Fluorine-containing pharmaceuticals approved by the FDA in 2020: Synthesis and biological activity, *Chinese Chemical Letters*, 32, 3342-3354.
10. He, J., Li, Z., **Dhawan, G.**, Zhang, W., Sorochinsky, A. E., Butler, G., Soloshonok, V. A. and Han, J. (2022) Fluorine-containing drugs approved by the FDA in 2021. *Chinese Chemical Letters*, In press.
11. **Chowhan, R. K.,** Hotumalani, S., Rahaman, H., and Singh, L. R. (2021) pH induced conformational alteration in human peroxiredoxin 6 might be responsible for its resistance against lysosomal pH or high temperature. *Scientific reports*, 11(1), 1-10.
12. Kumari, A., **Chowhan, R. K.**, Kakchingtabam, P., Shahnaj, S., Rahaman, H., Ansari, M. S., and Singh, L. R. (2021). Peroxiredoxin-6: A Guardian of Lung Pathophysiologies. *Current Protein and Peptide Science*, *22*(9), 666-674.
13. Batla, S. C., Gogna, M., Jain, P., Singh, N., Mukherjee, S., **Kalra, G.** (2021) Signaling mechanisms and biochemical pathways regulating pollen-stigma interaction, seed development and seedling growth in sunflower under salt stress. *Plant Signaling and Behaviour,* 16(11), 1958129.
14. Chourasiya D., Gupta M. M, **Sahni S.,** Oehl F., Agnihotri R., Buade R., Maheshwari H. S., Prakash A. and Sharma M. P. (2021) Unraveling the AM fungal community for understanding its ecosystem resilience to changed climate in agroecosystems.*Symbiosis,* 84(3), 295–310.
15. Kohli, S., Rathee, G., **Hooda, S.**, and Chandra, R. (2021)Al_2O_3/CuI/PANInanocomposite catalyzed green synthesis of biologically active 2-substituted benzimidazole derivatives. *Dalton Transactions*, 50(22), 7750-7758.
16. Gupta, D., Samal, R. R., Gautam, D., **Hooda, S.**, and **Kumar, S**. (2021) Multifunctional activity of graphene oxide-based nanoformulation against the disease vector, *Aedes aegypti.Journal of Applied and Natural Science*, 13(4), 1265-1273.

17. Malik, V., Saya, L., Gautam, D., **Sachdeva, S**., **Dheer, N., Arya, D. K**., **Gambhir, G.** and **Hooda, S.** (2022) Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites. *Polymer Bulletin*, 80(1), 1-36.
18. Saya, L., Malik, V., Gautam, D., **Gambhir, G.**, Singh, W. R. and **Hooda, S.** (2021) A comprehensive review on recent advances toward sequestration of levofloxacin antibiotic from wastewater. *Science of the Total Environment*, 183, 152529.
19. **Gambhir, G.**, Gautam, D., Saya, L., Kumar, A., Kumar, S., Singh, A., Singh, S., Chandra, R. and **Hooda, S.** (2022) A Novel Terpolymer Membrane-Based Electrode Sensor for Selective Determination of Cd(II) Ions, *Asian Journal of Chemistry*, 34 (3), 749-756.
20. Bargujar, S., **Gambhir, G.**, Raigar, M. B., **Hooda, S.**, **Arya, D. K.** and **Bhatia, M.** (2022) A new polysaccharide-based ion-exchange resin for industrial wastewater treatment. *Polimery*, 67(5), 212-219.
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2. **Chaudhary, R.** (2021) Sighting of Plain Tiger (*Danaus chrysippus,* Linn., 1758) form *dorippus* in New Delhi, India, *Bionotes*, 23, 62.
3. **Chaudhary, R.** and **Kumar, V.** (2021) Genera of ants associated with larvae of Plains Cupid (*Chiladespandava,*horsfield, 1829) Iinsecta: Lepidoptera: Lycaenidae) infesting Cycas, in Delhi, India, and an insight into the nature of their interaction, *Bionotes*, 23, 88.
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Appendix IX

Training Received by Faculty

Biomedical Science

1. Dr Sunita Jetly attended International Conference on infection and immunity held at Daulat Ram College, University of Delhi from October 8-10, 2021.
2. Dr Satendra Singh attended Five Day Workshop on Flow cytometry and qPCR based blood analysis organized by Department of BMS, Acharya Narendra Dev College, DU from October 20-24, 2021.
3. Dr Satendra Singh attended National seminar on "Introduction to Bionest-UDSC and Bio entrepreneurship" organized by Department of BMS, Acharya Narendra Dev College, DU on February 15, 2022.
4. Dr Rimpy Kaur Chowhan attended E-workshop on "Meta-sentiment-bibliometric Analysis using R" organized by Commacad from September 27-29, 2021

Botany

1. Dr Anupama Shukla attended five day FDP on 'Environmental Audit' conducted by Kirori Mal College, University of Delhi in association with MHRD PMMMNMTT from June 28th -July 2nd, 2021.
2. Dr Anupama Shukla attended one and a half month Executive Development Programme (equivalent to Certificate course) on "Hands-on with MS Office Essentials" conducted by Department of Vocation, Ramanujan College; University of Delhi, from July 19th-September 3rd, 2021.
3. Dr Anita Narang attended five day FDP on 'Environmental Audit' conducted by Kirori Mal College, University of Delhi in association with MHRD PMMMNMTT from June 28th -July 2nd, 2021.
4. Dr Anita Narang attended one and a half month Executive Development Programme (equivalent to Certificate course) on "Hands-on with MS Office Essentials" conducted by Department of Vocation, Ramanujan College; University of Delhi, from July 19th-September 3rd, 2021.
5. Dr Yash Mangla attended one week (Online) Interdisciplinary Faculty Development Programme on 'Interdisciplinary Studies and Higher Education: Prospects and Challenges', organised by Dyal Singh College, University of Delhi in collaboration with Mahatma Hansraj Faculty Development Centre Hansraj College, University of Delhi, 26th - 31stJuly, 2021.
6. Dr Anita Thakur attendedfive-week National Workshop on Statistical Analysis of Biological Data with grade A+, organised by Department of Botany, Zakir Husain Delhi College, University of Delhi, 17th Jan- 21st Feb, 2022.
7. Dr Manoj Kumar attended FDP on Edible Mushrooms- From Lab to Farm' organized by Shaheed Rajguru College of Applied Sciences for Women, 15th Feb 2021-19th Feb 2021.
8. Dr SumitSahni attended Applications of AI and Machine Learning' organized by Rajasthan Technical University (KOTA) Aryabhatta College of Engineering , Ajmer, 02-06 February, 2021.

9. Dr SumitSahni attended Faculty Development Program on Edible Mushrooms-From Lab to Farm held from 15th Feb 2021-19th Feb 2021
10. Dr SumitSahni attended 1 week online FDP on "Applications of Genomics, Metagenomics and Bioinformatics in Biological Systems" organized by Mahatma Hansraj Faculty Development Centre, Hansraj College,16th- 20th August, 2021.
11. Dr SumitSahni attended Advanced Online Refresher Course/Two Week FDP on "Data Visualization with Tableau" organized by Guru Angad Dev Teaching Learning Centre, a centre under PMMMNMTT, Ministry of Education, Government of India in collaboration with Praxis Business School from 12th Aug – 25th August 2021

Chemistry

1. Dr.Geetu Gambhir attended Four-Quadrant Model for Development of E-Content, MOOCs and Teacher's e-Kit, Online, 29th September to 5th October, 2021, Guru Angad Dev Teaching Learning Centre of MHRD, University of Delhi.
2. Dr Pooja Bhagat attended 'V-Lab Development Bootcamp 1.0' ,January 17 to January 22, 2022 organized by Acharya Narendra Dev College under the aegis of DBT STAR College Scheme.
3. Prof. Rashmi Thukral, Dr. Kavita Mittal were involved in developing E-content in four quadrants in chemistry at GAD-TLC of MHRD.
4. Dr Manisha Jain and Dr NeetiMisra were involved in Development of virtual lab simulation on redox titrations
5. Dr.NeetiMisra attended Online interdisciplinary two-week refresher course on 'Managing online classes and co-creating MOOCS 11.0' from 07-21 February, 2022 organized by Teaching Learning Centre, Ramanujan College, University of Delhi under the aegis of PMMMNMTT.
6. Dr. Pooja Bhagat and Dr.Geetu Gambhir attended An International Conference of Indian Network for Soil Contamination Research (INSCR) on 'Microbes in Sustainable Development' on November 15-18, 2021.
7. Dr Pooja Bhagat, Dr Geetu Gambhir, Dr Manisha Jain and Dr NeetiMisra attended A 5-day online bootcamp' V-Lab Development Bootcamp 1.0' organized by Acharya Narendra Dev College from January 17 to January 22, 2022 under the aegis of DBT STAR College Scheme.
8. Dr. Kavita Mittal participated in webinar titled "Plagiarism in Academic Writing & Research" organized by RASAYANATVA: The Chemical Society of Hansraj College, University of Delhi on 20th November, 2021.
9. Dr. Kavita Mittal participated in Two days International E-Conference on "Recent Trends in Drug Discovery and Development" organized by Department of Chemistry, Maitreyi College, University of Delhi, from 8th- 9th October, 2021.
10. Dr Neeti Mishra participated in webinar on "Understanding Plagiarism Detection Software Ouriginal" organized by University of Delhi in association with eGalactic Pune on 28th January 2022.
11. Dr Neeti Mishra participated in a four-day National Virtual Lab Workshop on "Computer aided Drug design" organized by Department of Chemistry, Aggarwal College Ballabhgarh from 6-9th October 2021.

Computer Science

1. Ms Priyanka Sharma attended Four Week Faculty Induction Programme for "Faculties in Universities/Colleges/ Institutes of Higher Education", under the aegis of Ministry of Human Resource Development Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching Learning Centre Ramanujan College University of Delhi from July 19- August 17, 2021.
2. Ms Shiva Saini, Ms. Nishu Singh, Ms. Gunjan Rani, Ms. Vandita Grover and Mr. Mahesh Kumar attended Four Week Faculty Induction Programme for "Faculties in Universities/Colleges/ Institutes of Higher Education", under the aegis of Ministry of Human Resource Development Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching Learning Centre Ramanujan College University of Delhi from March 20- April 19, 2022.
3. Dr Gunjan Rani attended One week online FDP on "Internet of Things (IoT)" by ATAL Academy from December 06-10, 2021.
4. Dr Vandita Grover attended One week online FDP on "Cyber Security Analytics", JNTU, AnantpurNovember, 17-21, 2021.
5. Dr Vandita Grover attended One week online FDP on "Critical Design Thinking in Engineering and Collaborative Team Learning Strategies for Effective Team Work" from August 9-13, 2021
6. Ms. Priyanka Sharma, Ms. Gunjan Rani attended Three months online CSEDU Program (Every weekend) on "Effective Teaching of Machine Learning" from IIT Delhi from 25th Aug ust- December 03,2022.
7. Ms. Nishu Singh attended Three months online CSEDU Program (Every weekend) on "Effective Teaching of Programming in Python" from IIT Delhi from 25th Aug ust- December 03,2022.

Electronics

1. Prof. Anju Agrawal, Dr. Ravneet Kaur, Dr. Monika Bhattacharya, Ms. Gauri Ghai attended Online Faculty Development Programs (FDPs) / Refresher Coursesfor capacity building towards NEP-2020 based Skill Enhancement Courses, Big Data Analytics (FDP-106),organised by University of Delhi in collaboration with GAD-TLC, a Centre under PMMMNMTT, Ministry of Education, Government of India held from November 4 2022 to November 11, 2022.
2. Prof. Anju Agrawal, Dr. Ravneet Kaur, Dr. Monika Bhattacharya and Ms. Gauri Ghai attended Online Faculty Development Programs (FDPs) / Refresher Coursesfor capacity building towards NEP-2020 based Skill Enhancement Courses, Python: Essentials, Programmingand Analytics (FDP-102),organised by University of Delhi in collaboration with GAD-TLC, a Centre under PMMMNMTT, Ministry of Education, Government of India held from October 27, 2022 to November 3, 2022.

3. Dr. Monika Bhattacharya attended MATLAB Workshop for Faculty Members organised by FOSS Club, Department of Computer Science, Acharya Narendra Dev College, Universiry of Delhi on October 12 and October 17, 2022.
4. Prof. Anju Agrawal, Dr. Ravneet Kaur, Dr. Monika Bhattacharya, Mr. Dinesh Kumar and Ms. Gauri Ghai, attended Virtual Mini Colloquia (MQ) on 75thAnniversary of Transistor Invention" organised by IEEE EDS Delhi Chapter (New Delhi, India) from August 22, 2022 to August 29, 2022.
5. Dr. Ravneet Kaur, attended IPR awareness/training program under the special mission called "National Intellectual Property Awareness Mission (NIPAM)" organised by Acharya Narendra Dev College, University of Delhi on August 27, 2022.
6. Mr. Dinesh Kumar attended Two weeks (Online) Interdisciplinary Faculiy Development Programme on Introduction to Python Programming organised by Delhi Effective Education Pedagogy Cluster in collaboration with Mahatma Hansraj Faculty Development Centre Hansraj College, University of Delhi, from August 8, 2022 to August 19, 2022.
7. Prof. Anju Agrawal, Dr. Ravneet Kaur, Dr. Monika Bhattacharya, Ms. Gauri Ghai, attended One Week Online Workshop on "Recent Development in the Field of Electronics (RDFE-2022) organised by Department of Electronic Science, University of Delhi, in collaboration with IEEE EDS and IEEE APS & CRFID Delhi Chapter from July 25, 2022 to July 29, 2022.
8. Prof. Amit Garg , Prof. Anju Agrawal, Dr. Ravneet Kaur, Ms. Gauri Ghai, Dr. Monika Bhattacharya and Mr. Dinesh Kumar served as Resource Person in National Workshop on Skill Enhancement of Non-Teaching Staff (NWSENS-2022) organised by Acharya Narendra Dev College from July 13 to July 20, 2022.
9. Mr. Dinesh Kumar attended 2022 IEEE SPS Seasonal School on Al for Optimisation in Signal Processing (AISP) organisedbyIEEE Signal Processing Society Delhi Chapter from July 11, 2021 to July 15, 2021.
10. Dr. Monika Bhattacharya attended One Week Online Faculty Development Program On Advanced Research Methodology Applicable in New Education Policy,organised by Digvijai Nath Post Graduate College Gorakhpur & Science Tech Institute, Lucknow from June 22 to June 28, 2022.
11. Dr. Monika Bhattacharya and Ms. Gauri Ghai attended Biotech Startup Expo – 2022 , Biotech Startup Innovations: Towards AatmaNirbharBharat,organised by DBT, Ministry of Science and Technology, Government of India, at Pragati Maidan, New Delhi from June 9 to June 10, 2022.
12. Dr. Monika Bhattacharya attended Virtual Mini-Colloquia (MQ) on Advances in II-N Devices and Systems organised by IEEE, Electron Devices Society (EDS), Delhi Chapter from June 1 to June 4, 2022.

13. Dr. Monika Bhattacharya attended Online International Workshop on Statistical Data Analysis using SPSS organised by Aryabhatt Institute of Academic and Research & Science Tech Institute, Lucknow from May 21 to May 27, 2022.
14. Prof. Anju Agrawal, Dr. Ravneet Kaur, Ms. Gauri Ghai, Mr. Dinesh Kumar and Dr. Monika Bhattacharya conducted Training workshop and demonstration of Control Lab with software and data acquisition and Universal Dev Board with FPGA and CPLD for Teachers in collaboration with industry partner M/s Silicom Electronics on April 25, 2022.
15. Prof. Anju Agrawal, Dr. Ravneet Kaur, Ms. Gauri Ghai, Mr. Dinesh Kumar and Dr. Monika Bhattacharya conducted Training Workshop and demonstration of lab Equipment for Teaching and Non- Teaching Staff in collaboration with industry partner M/s Vijayanta Electronics on March 23, 2022.
16. Dr. Ravneet Kaur and Ms Gauri Ghai served as Resource person in a five-day workshop on “Development of Competency Framework and Revisiting of the Learning Outcomes in Science and Mathematics (PAC 6.01/2021-22)” held online at DESM, NCERT, New Delhi from March 7, 2022 to March 11, 2022.
17. Mr. Dinesh Kumar attended One-Day Interdisciplinary National Workshop entitled "WELLNESS AND LEARNING: A Holistic Approach Towards Leading a Meaningful Life" organised by Guru Angad Dev Teaching Learning Centre, a Centre under the Pandit Madan Mohan Malviya National Mission on Teachers and Teaching (PMMMNMIT) of Ministry of Education, SGTB Khalsa College, University of Delhi., on February 12, 2022.
18. Mr. Dinesh Kumar attended webinar on Accelerate your research using Elsevier's Scopus organised by., Aishwarya nayal Customer Constuitant, University of Delhi from February 11, 2022.
19. Mr. Dinesh Kumar attended Faculty Development Program on “Developing Positive Mental Health for Teaching-Learning Environment” organised by Guru Angad Dev Teaching Learning Centre, a Centre under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMIT) of Ministry of Education, SGTB Khalsa College, University of Delhi, from January 25, 2022 to January 31, 2022.
20. Dr. Ravneet Kaur served as a Resource person in a five-day workshop on “Online Course in Teaching of Science at Upper Primary Stage.” held online at DESM, NCERT, New Delhi from January 10, 2022 to January 14, 2022.
21. Dr. Ravneet Kaur served as a Resource person in a five-day workshop on “Online Course in Teaching of Science at Upper Primary Stage.” held online at DESM, NCERT, New Delhi from January 17, 2022 to January 21, 2022.
22. Dr. Ravneet Kaur and Ms. Gauri Ghai attended 6-Day Bootcamp entitled “Virtual Lab Development 1.0” organised by ANDC, University of Delhi, New Delhi, from January 7, 2022 to January 21, 2022

23. Dr. Ravneet Kaur, Dr. Monika Bhattacharya and Ms. Gauri Ghai of the department served as Resource Person in one-day interaction programme “Science Adda”, held on December 20, 2021, organized under the DBT Star College Scheme by Acharya Narendra Dev College.
24. Dr. Ravneet Kaur delivered a lecture as a “Resource Person” on the topic Communication: Past, Present and Future on February 3, 2022, organized by Internal Quality Assurance Cell (IQAC) of ARSD College.
25. Dr. RavneetKaurand Ms. Gauri Ghai attended 6-Day Bootcamp entitled “Virtual Lab Development 1.0” organized by ANDC, University of Delhi, New Delhi from January 17, 2022 to January 22, 2022.
26. Dr. Ravneet Kaur attended the webinar on, “Understanding Plagiarism Detection Software Ouriginal” organized by University of Delhi in Association With eGalactic Pune on January 28, 2022.
27. Dr. Ravneet Kaur amd Ms. Gauri Ghai attended the Training Program on “New Measurement Technologies and Simulation Techniques in Electronics" organized by IEEE Electron Device Society-Delhi Chapter & Department of Electronic Science, University of Delhi South Campus during October 17-18, 2022.
28. Attended Special Mini Colloquia (MQ) in Virtual Mode on "Emerging Device Architectures for Tunnel FET" as part of the "75th Anniversary of Transistor Invention" organized by IEEE Electron Device Society - Delhi Chapter (New Delhi, India), The National Academy of Sciences India - Delhi Chapter and DeenDayal Upadhyaya College (University of Delhi) during September 26 to October 5, 2022.
29. Prof. Anju Agrawal, Dr. Ravneet Kaur and Ms. Gauri Ghai attended Online Lecture Series on “Fundamentals and Applications of Technology Driven Sensors.” organised by IEEE EDS Delhi Chapter, from September 24, 2021 to September 25, 2021.
30. Prof. Anju Agrawal, Dr. Ravneet Kaur and Ms. Gauri Ghai attended Robonetics: 30 days intense workshop on “Robotics and it’s analogy implementation organised by Tech Analogy, from September 24, 2021 to October 23, 2021.
31. Mr. Dinesh Kumar attended Faculty Development Program on Digital Skills for Teachers organised by Guru Angad Dev Teaching Learning Centre, a Centre under the Pandit Madan Mohan Malviya National Mission on Teachers and Teaching (PMMMNMIT) of Ministry of Education, SGTB Khalsa College, University of Delhi., from November 10, 2021 to December 4, 2021.
32. Dr. Ravneet Kaur attended IP Awareness/Training program under National Intellectual Property Awareness Mission organised by Intellectual Property Office, India, on December 29, 2021.
33. Dr. Ravneet Kaur attended International Symposium on “History and Future of Transistors” organised by IEEE EDS Delhi Chapter, on December 23, 2021.

34. Dr. Ravneet Kaur attended Vice-Chancellors' Conclave On "National Education Policy 2020: Its Implementation, Opportunities and Challenges organised by Rajdhani College, University of Delhi, New Delhi, on December 16, 2021.
35. Mr. Dinesh Kumar attended IEEF SPS AIVA 2021 (Artificial Intelligence for Visual Applications) organised by., IEEE Signal Processing Society Delhi Chapter and Indraprastha Institute of Information Technology-Delhi, India in collaboration with 10 SPS Chapters of the IEEE India Council and the SBl Lab of IIT-D from June 24, 2021 to June 28, 2021.
36. Mr. Dinesh Kumar attended One week (Online) Interdisciplinary Faculty Development Programme on Basics of Research" " organised by., Mahatma Hansraj Faculty Development Centre Hansraj College, University of Delhi in collaboration with PARAMARSH, UGC SCHEME from June 18, 2021 to June 24, 2021.

Physics

1. The following faculty members successfully participated in the Intellectual Property Awareness program under National Intellectual Property Awareness Mission (NIPAM) on January 19, 2022

Prof. Arijit Chowdhuri	Dr. Manisha Verma,
Dr.Sanjeeta Rani	Dr, Satya Prakash Yadav
Dr. V Bhasker Raj	Dr. Sanjay Kumar

2. Dr. Sanjeeta Rani 5-day online bootcamp' V-Lab Development Bootcamp 1.0' organized by Acharya Narendra Dev College from January 17 to January 22, 2022 under the aegis of DBT STAR College Scheme.
3. Dr. V. Bhasker Raj Participated in online faculty development program on moocs and e-learning in context of National education policy organised by Delhi school of public policy and governance, institution Of eminence, university of delhi in collaboration with national law university and judicial Academy assam and bhartiyashikshanmandal and national institute of open schooling, Ministry Of Education, Government Of India From October 18, 2021 To October 24, 2021.
4. Dr. Pradeep Kumar Gupta successfully completed two week online Refresher Course in Physics from 28 July to 11 August 2022, from Teaching Learning Centre, Ramanujan College under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) scheme.
5. Dr. Satya Prakash Yadav successfully completed four week online Orientation Course from 19 July to 17 August 2022, from Teaching Learning Centre, Ramanujan College under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) scheme
6. Dr. V. Bhasker Raj successfully completed Two Week (Online) Interdisciplinary Faculty Development Programme on 'MOOC's, E-Content Development, Research Methodology and Statistical Tools in Open Education World '(3rd August – 17th August 2021) organised by Kalindi College, University of Delhi in collaboration with Mahatma Hansraj Faculty Development Centre Hansraj College, University of Delhi under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) scheme

7. Dr. Rohtash Singh successfully completed Two Week (Online) Interdisciplinary Faculty Development Programme on 'MOOC's, E-Content Development, Research Methodology and Statistical Tools in Open Education World '(3rd August – 17th August 2021) organised by Kalindi College, University of Delhi in collaboration with Mahatma Hansraj Faculty Development Centre Hansraj College, University of Delhi under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) scheme
8. Dr. Sanjay Kumar successfully completed Two Week (Online) Interdisciplinary Faculty Development Programme on 'MOOC's, E-Content Development, Research Methodology and Statistical Tools in Open Education World '(3rd August – 17th August 2021) organised by Kalindi College, University of Delhi in collaboration with Mahatma Hansraj Faculty Development Centre Hansraj College, University of Delhi under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) scheme

Zoology

1. Prof. Sarita Kumar attended AHI EVRAN International Conference on Scientific Research, Kırşehir Ahi Evran University, Turkey, November 30-December 2, 2021.
2. Prof. Sarita Kumar, Prof Ravi Toteja, Dr Monica Misra, Prof Seema Makhija, Dr Aparna Sharma and Dr Sweety Shrimali Attended IP Awareness/Training Program organized under the National Intellectual Property Awareness Missionby the Intellectual Property Office, India, 29th December 2021.
3. Prof Ravi Toteja and Prof Seema Makhija attended 5-day online bootcamp' V-Lab Development Bootcamp 1.0' organized by Acharya Narendra Dev College from January 17 to January 22, 2022 under the aegis of DBT STAR College Scheme.
4. Mr Ravinder Sagar attended Webinar Series (Professional) on "*Transforming Teaching-Learning Process using ICT TOOLs*" from 28-30th August 2020 organized by PGDAV College, University of Delhi.
5. Mr Ravinder Sagar attended Webinar Series (Professional) on "*Transforming Teaching-Learning Process using ICT TOOLs*" from 28-30th August 2020 organized by PGDAV College, University of Delhi.
6. Dr Aparna Sharma attended One Week Faculty Development Programme (online) on 'Computational Approach to Drug Discovery' conducted from 02 August to 07August, 2021 organised by Deshbandu College, University of Delhi and Center for Bioinformatics, Computational and Systems Biology in collaboration with Mahatma Hansraj Faculty Development Center, Hansraj College, University of Delhi.
7. Dr Sweety Srimali Attended an International Conference on Chronobiology (ICC 2021)held virtually via Zoom,organized by JNCASR, Bangalore, INDIA and UC Davis, USA, 15th – 17thJuly 2021.
8. Mr Vineet Girdhwal Participant- National workshop on Flow cytometry and qPCR based blood analysis- October 20-24, 2021.
9. Mr Abhay Pratap Singh attended FDP on Wildlife Conservation and Management held at Daulat Ram College, University of Delhi in collaboration with Mahatma Hansraj Faculty Development Centre, Hansraj College, University of Delhi from October 04-09, 2021.
10. Ms Bhumika Chauhan attended Interdisciplinary Faculty Development Programme (FDP) on "Roadmap for building New India with New Education Policy" held at Hansraj College, University of Delhi from July 21-25, 2021

Appendix X

Exhibitions/seminars/training courses conducted

Biomedical Science

1. Prof.Urmi Bajpai organized DBTSTAR-IQAC_ANDC Webinar on "Designing of a Novel Vector for One-Step Cloning & Expression in *E.coli*" by Mr Shino James, IISER, Bhopal on January 28, 2022.
2. Prof.Urmi Bajpai organized DBTSTAR-IQAC_ANDC Webinar on "Introduction to BioNEST-UDSC & Bio entrepreneurship" by Mr Vijay Kantharia, CEO, BioNEST-UDSC on February 15, 2022.
3. Prof. Urmi Bajpai and Dr Rimpy Kaur Chowhan- organized Online Python learning workshop with resource persons -Ms Shruti Gupta and Mr Alok Anand, Jawaharlal Nehru University .
4. November 2021. (weekends, 20 hour).
5. Prof.Gagan Dhawan (Coordinator) organized National Seminar on Vigilance, Corruption and Transparency in Governance - A Re-assessment on the occasion of Vigilance Awareness Week 2021 being organized in association with Vivekananda College and Daulat Ram College, University of Delhi on Noveber 01, 2021.
6. Dr Sunita Jetly, Dr Ritu Khosla and Dr Deepshikhaorganised a Five Day National Workshop (Virtual) On Flow Cytometry and qPCR Based Blood Analyses from October 20-24, 2021.
7. Dr.Archna Pandey (Convenor) organised Six Days National workshop on "Skill enhancement of Non-teaching staff" from June13-20, 2022.

Botany

1. Organized One Week online Boot Camp on Virtual lab development under the aegis of DBTSTAR College Scheme from January 17-22, 2022.About 250 students across departments registered for this workshop. The speciality of this workshop is that Resource persons were also UG students. A wonderful P-P learning experience.
2. Organized a workshop on Tools in Modern Biology for the support staff to familiarize them with the new equipment purchased under the STAR Scheme, April 2022.
3. Organized an online workshop on Initiating Virtual Labsin collaboration with IITDon August 24, 2021.
4. Organized a hands on workshop on Revisiting Laboratory Techniques in Botany October 20-26, 2021.
5. Organized a hands-on workshop on Superheroes against Superbugs for the students to familiarize them with Anti-microbial resistance and Foldscope, October 11, 2022.
6. Organized a workshop on How to Read Scientific Literature for the students on October 14, 2022.

Chemistry

1. Prof. Sunita Hooda, Dr.Geetu Gambhir, Dr. Kavita Mittal organized Lecture series in online mode of "Journey of an Alumni" held weekly from 16th October, 2021, Acharya Narendra Dev College, DU.
2. Prof. Sunita Hooda, Dr.Geetu Gambhir, Dr. Pragati Malik organized Two days online workshop on "Photoshop" organized by Acharya Narendra Dev College from 30th Sept 2021 to 1st Oct 2021under the aegis of IQAC and DBT STAR College Scheme.
3. Prof. Sunita Hooda, Dr.Geetu Gambhir, Dr. Pragati Malik organized Two days online workshop on Computational Chemistry organized by Acharya Narendra Dev College from 6th Oct - 7thOct 2021 under the aegis of IQAC and DBT STAR College Scheme.
4. Dr.Geetu Gambhir, Prof. Sunita Hooda, Drushya organized Five days workshop on Analytical Laboratory techniques organized by Acharya Narendra Dev College from 25thOct 2021 to 29th Oct 2021under the aegis of IQAC and DBT STAR College Scheme.
5. Department of Chemistry organized The Chemistry Fest "SYNERGIA – 2022",wasorganised by 'ABHIKRIYA' The Chemistry Society, on19th April, 2022.It comprised of Guest lecture of Ms. Shreya Arora (Taylor & Francis Group) followed by many student activities like Paper presentation, ABHIQUEST (Quiz), ABHICHITRA (Rangoli), *etc*.
6. Dr Pooja Bhagat organizedTwo days 'hands on training' workshop for the skill development of the interested residents of the adopted area, Govindpuri under the aegis of UBA

Computer Science

1. Five Days online Workshop under FOSS Club on"Data Analysis and Visualization of Covid-19 data using Python "on 22- 26 June, 2021"by Dr. Sharanjit Kaur, Dr. Harita Ahuja, Ms. Gunjan Rani, Ms. Vandita Grover, Mr. Mahesh Kumar, Faculty of Computer Science Department, ANDC, DU.
2. Two Days online Workshop under FOSS Club on" Effective Presentation and Image Management for Success"on 24 Aug. 2021-25 Aug. 2021 by Mrinal Gupta Virmani, Confidence Coach &Softskills Trainer, Image Consultant & Chartered Accountant.
3. Two days online workshop on Front End WebUI Frameworks Overview: Bootstrapon2nd Oct. 2021 – 3rd Oct, 2021 by Mr. Ashwani Bhatia, Web Designer/ Developer.
4. Two Days online Workshop under FOSS Club on "HTML: A Prerequisite for MERN Stack"on 6th Oct. 2021 – 7th Oct, 2021 by Mr. Rishi Sarbobhoum, Mr. Aditya Goyal, Mr. Devesh Yadav, Mr. Sushant Sharma, Students, ANDC.
5. Five Days online Workshop under FOSS Club on" A First Step Towards Developing Virtual Lab Using MERN Stack" on 9th Oct2021 – 24th Oct 2021 (only on Saturday and Sunday)by Mr. Prabhat Chandra, Freelance Trainer/ Developer.
6. Five Days online Workshop under FOSS Club on *"Face* Recognition using Python" on 26th Oct. 2021-30th Oct 2021 by Dr. Xavier Chelladurai, Director and Professor, Christ Human Resource Centre.

7. Three Days online Workshop under FOSS Club on" Let's Talk DevOps" on 11th March 2022 to 13thMarch, 2022by Mr. Shailesh Thakur, Senior DevOps Engineer, o9 Solutions Inc.

Electronics

1. Training workshop and demonstration of Control Lab with software and data acquisition and Universal Dev Board with FPGA and CPLD for Teachers in collaboration with industry partner M/s Silicom Electronics on April 25, 2022.
2. Training Workshop and demonstration of lab Equipment for Teaching and Non-Teaching Staff in collaboration with industry partner M/s Vijayanta Electronics on March 23, 2022.
3. One Week National Workshop on Skill Enhancement of Non-teaching Staff (Coordinating department) from July 13-20, 2022.
4. One Week National Workshop on Career and Skill Enhancement for Non-teaching Staff (Coordinating department) from September 15-21, 2022

Physics

1. Hands on workshop on Digital Systems & Applications with Microprocessors and Microcontrollers organized by Department of Physics and IQAC, Acharya Narendra Dev College under the aegis of DBT STAR College scheme on October 20 – 27, 2021.
2. Hands – on workshop on Modern Physics organized by Department of Physics and Internal Quality Assurance Cell (IQAC) Acharya Narendra Dev College under the aegis of DBT STAR College scheme on November 10 – 17, 2021.
3. Hands – on workshop on Basic & Contemporary Thermal Physics, Mechanics and LASER Application organized by Department of Physics and Internal Quality Assurance Cell (IQAC) Acharya Narendra Dev College under the aegis of DBT STAR College scheme on November 12 – 19, 2021.
4. Organized a webinar on Intellectual Property Rights Awareness Program under National Intellectual Property Awareness mission (NIPAM) under the aegis of DBT Star College Scheme in collaboration with Office of the Controller General of Patents, Designs & Trade Marks Department for Promotion of Industry and Internal Trade Ministry of Commerce & Industry, Government of India on January 19, 2022.

Zoology

1. Organized seven days Hands-on workshop on Biological Techniquesorganized under the aegis of DBTSTAR College Scheme and IQAC from September 27 –October 4, 2021.During this workshop, students were given hands on experience for the preparation of LB Media, Blood group determination. SDS-PAGE and ELISA etc
2. Organized two days Hands-on workshop on Tools and Techniques of Biotechnology under the aegis of DBTSTAR College Scheme and IQAC from April 7-8, 2022. During this workshop, students were given hands on experience for DNA isolation, Agarose Gel Electrophoresis, PCR, Haemoglobin estimation, BP measurement and Southern Blotting

3. Organized One Week online Boot Camp on Virtual lab development under the aegis of DBTSTAR College Scheme from January 17-22, 2022.About 250 students across departments registered for this workshop. The speciality of this workshop is that Resource persons were also UG students. A wonderful P-P learning experience.
4. Organized three days online International Conference of Indian Network for Soil Contamination Research (INSCR) on Microbes in Sustainable Development from November 15-18, 2021 in collaboration with various institutes.During this conference two workshops were organized on Bioinformatics and Art of scientific writing and Communications were organized for UG students. An Agar Competition was also organized, Students from across the globe participated in this.
5. Organized a workshop on Tools in Modern Biology was organized for the support staff to familiarize them with the new equipment purchased under the STAR Scheme.
6. Organized an online workshop on Initiating Virtual Labsin collaboration with IITDon August 24, 2021








Appendix XI

A. Outreach activities - College Level

1. Acharya Narendra Dev College, University of Delhi conducted a One Day Interaction Program called "Science Adda" (under the aegis of DBT Star College Scheme) for school students on December 20, 2021. A total of 14 schools registered for the workshop, while the number of individual participants attending the workshop was 33. The event was organized to give hands-on demonstration of some simple easy to do experiments by different departments of our college including Physics, Chemistry, Computer Science, Electronics, Biomedical Science, Zoology and Botany. The workshop was conducted in both physical as well as online mode. The session was concluded by an interesting quiz pertaining to the experiments shown and explained to the students. All the attendees were given certificates of participation, a foldscope and scientific kits for electronic experiments.
2. An outreach programme for school students, "ECOVILLE" was organized on February 27, 2022 as a part of the E- conference that invited submission of avant-garde research projects, video presentations, environmental quiz and paper presentations. The highlight of the day was the inauguration of Virtual lab presided over by Dr Garima Gupta, Scientist F, Department of Biotechnology, Govt. of India. A career counselling session was also organized for the school students One of the key highlights and a nicheendeavour by the college, this particular outreach program not only sought to introduce young minds to the infinite spectrum of research and innovative thinking, it also encouraged them by funding avant-garde projects, awarding exciting prizes for quiz winners and best presenters, while providing participation certificates to all.
3. The College organized a National workshop on Skill enhancement of Non-teaching staff (NWSENS-2022) from July 13-20, 2022. More than 60 non-teaching staff from various colleges of University of Delhi including Institute of Home economics, Lady Irwin college, Ramjas College, etc. participated in the workshop. The workshop was designed for holistic development of the non-teaching staff, and covered topics like financial management, tax-filling, stock-keeping, computational skills, operation of GeM portal, basic laboratory skills for safe handling and usage of scientific equipments raging from pH meters, electrophoresis units, centrifuges, micro-pipettes, microscopes and spectrophotometers.

B. Outreach activities - Popular lectures & workshops

Biomedical Science

1. Prof. Urmi Bajpai delivered talk in the Webinar on "Bacteriophages and encoded lysin enzymes as potential therapeutics" organized by Emerging Biopharmaceutical Manufacturers (EBPMN), and International Bacteriophage Research Consortium (IBRC) on December 3, 2021.

2. Prof.Urmi Bajpai delivered an online talk on “Bacterial infections, antibiotic resistance and prospects of phage lysins as a new class of antimicrobials” in the Biotechnology Lecture Series, organized by Department of Biotechnology, Cochin University of Science & Technology, Kochi, Kerela-682022 on April 12, 2022.
3. Prof. Urmi Bajpai delivered a talk on“Antibiotic Resistance: A silent epidemic”, at the SERB sponsored seminar on Drug Resistance: Causes and Challenges Ahead. Organized by Noida Institute of Engineering and Technology (Pharmacy Institute), Greater Noida on June 11, 2022.
4. Prof.Urmi Bajpai delivered a talk on “Computational Mining of Bacteriophage Genomes for Antibacterial Agents. Organized by Department of Computational Biology,Indraprastha Institute of Information Technology (IIIT), Okhla Phase III, Delhi on July 1, 2022.
5. Prof.Gagan Dhawan delivered talk on 13th annual conference on Advances in Cell and Tissue Culture 2021 (ACTC 2021), on topic “Exploring the effect of polydopamine-aminoglycoside nanoconjugates for combating bacterial biofilms and augmenting cell migratory effect” on November 3, 2021.
6. Dr Sunita Jetly as state blood cell Coordinator organized Webinar and Screening program for thalassemia in NSUT, Gargi College and BCAS, DU on October 29, 2021.
7. Dr Sunita Jetly held the position of session chair on October 10, 2021 for one of the session in the International Conference on infection and immunity from October 8-10, 2021.
8. Dr Satendra Singh, Dr Rimpy Kaur Chowhan and Dr Ritu Khosla delivered talk on “Document Verification” at National workshop on “Skill enhancement of Non-teaching staff” on July 13, 2022.
9. Dr Satendra Singh, Dr Rimpy Kaur Chowhan and Dr Ritu Khosla delivered talk on “Working of electrophoresis and Centrifuge machine” at National workshop on “Skill enhancement of Non-teaching staff”.on July 14, 2022.
10. Dr Rimpy Kaur Chowhan delivered talk on “ Operation of GeM Portal ” at National workshop on “Skill enhancement of Non-teaching staff” on July 19, 2022.
11. Dr Ritu Khosla delivered talk on Principle and working of q-PCR atNational Workshop on “Flow Cytometry and qPCR based Blood Analyses”.on October 20-24, 2021.

Botany

1. Dr Rashmi Sharma organized a interactive session was organised at Tagore International School to familiarise students about CUET and the admission process to Central Universities with specific reference to University of Delhi and basic science courses on Jul 12, 2022.
2. Students from Shivaji College were trained at the Mushroom facility on lignocellulosic waste as a valuable bioresource.

Electronics

1. Science Education Outreach Program and workshop on Sensor Interfacing using Arduino and TinkerCAD simulation was organised for school students from October 18-30, 2021.

2. Organised International Day of Light 2021 Celebration under the theme ‘Let your Light Shine’ on May 16, 2021.
3. Dr. Ravneet Kaur and Ms Gauri Ghai served as a resource person in a five-day workshop on “Development of Competency Framework and Revisiting of the Learning Outcomes in Science and Mathematics (PAC 6.01/2021-22)” held online at DESM, NCERT, New Delhi from March 7, 2022 to March 11, 2022.
4. Dr. Ravneet Kaur and Ms Gauri Ghai served as a resource person in a five-day workshop on “Development of Competency Framework and Revisiting of the Learning Outcomes in Science and Mathematics (PAC 6.01/2021-22)” held online at DESM, NCERT, New Delhi from February 28, 2022 to March 4, 2022.
5. Dr. Ravneet Kaur serves as a resource person in a five-day workshop on “Online Course in Teaching of Science at Upper Primary Stage.” held online at DESM, NCERT, New Delhi from January 10, 2022 to January 14, 2022.
6. Dr. Ravneet Kaur serves as a resource person in a five-day workshop on “Online Course in Teaching of Science at Upper Primary Stage.” held online at DESM, NCERT, New Delhi from January 17, 2022 to January 21, 2022.
7. Dr. Ravneet Kaur delivered a lecture as a “Resource Person” on the topic Communication: Past, Present and Future on February 3, 2022, organized by Internal Quality Assurance Cell (IQAC) of ARSD College.
8. Prof. Amit Garg , Prof. Anju Agrawal, Dr. Ravneet Kaur, Ms. Gauri Ghai, Dr. Monika Bhattacharya and Mr. Dinesh Kumar served as Resource Person in National Workshop on Skill Enhancement of Non-Teaching Staff (NWSENS-2022) organised by Acharya Narendra Dev College from July 13 to July 20, 2022.

Physics

1. Dr. Mamta Bhatia, Program coordinator of one week online "Women and Sustainable Business Development": International Certificate program,20-25 January,2022,in collaboration with National Law University, Delhi and Trakya University, TURKIYE
2. Prof. Arijit Chowdhuri and Dr. V. Bhasker Raj have been resource persons in delivering knowledge content and conducting hands-on sessions on

a. Generating wave shapes using Function Generators (FGs)
b. Analyzing wave shapes using Digital Storage Oscilloscopes (DSOs)

3. at the National Workshop on Skill Enhancement of Non-teaching Staff (NWSENS – 2022) organized in commemoration of Centenary Celebrations of University of Delhi under the aegis of DBT STAR College Scheme and IQAC from July 13 - 20, 2022
4. Prof. Arijit Chowdhuri and Dr. V. Bhasker Raj have been coordinators for Intellectual Property Awareness program under National Intellectual Property Awareness mission (NIPAM) on January 19, 2022.
5. As resource persons of Science Adda Program, Prof. Arijit Chowdhuri, Dr. Sanjay Kumar and Dr. V. Bhasker Raj conducted hands-on demonstration of the following experiments to school students

a. Total internal reflection using LASER light.
b. To study diffraction pattern of LASER using plane transmission grating.

c. To study diffraction pattern of LASER using plane reflection grating and measure its wavelength using a ruler as grating.
d. To study the flow of water through narrow tube. optical experiments including total internal reflection.

6. Prof. Arijit Chowdhuri, Dr. Sanjay Kumar and Dr. V. Bhasker Raj have been resource persons in the Hands-on workshop on Digital Systems and Applications with Microprocessors and Microcontrollers organized by Department of Physics & IQAC, Acharya Narendra Dev College October 20-27, 2021.
7. Prof. Arijit Chowdhuri, Dr. Siddhartha and Dr. Ambika have been resource persons Hands-on Workshop on Modern Physics. November 10-17, 2021.
8. Prof. Arijit Chowdhuri, Dr. Rakesh Sonker and Mr. Pawan Kumar have been resource persons Hands – on workshop on Basic & Contemporary Thermal Physics, Mechanics and LASER Application November 12 – 19, 2021.
9. 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 2022.

Zoology

1. An online International Outreach Program was organized to Celebrate International Microorganism Day as "MICROSPHERE 2021" by ANDC in collaboration with 10 different institutes to generate awareness about microbes to the school stuents on September 27, 2021. About 800 students attended the program.
2. Dr Rahul Dev, Dr Neel Gagan Singh and Prof. Seema Makhija were resource person in demonstrating Isoltion of DNA from Cabbage to school students during the Science Adda Program held on December 13, 2021 at ANDC under the aegis of DBT STAR College Scheme.
3. Dr Rahul Dev, Dr Neelgagan Singh, Mr Vineet Girdharwal and Prof Seema Makhija were resource persons in demonstrating the following practicals to the Non Teaching staff during National workshop on Skill enhancement of Non-teaching staff (NWSENS-2022) from July 13-20, 2022:
    a. Use of UV-VIS Spectrophotometer and
    b. Colorimeter
    c. Handling and Cleaning of Microscopes
    d. Caliberation of Micropippetes

4. Dr Monica Misra, Professor Seema Makhija. Dr Neel Gagan Singh and Dr Sushma Bhardwaj organized a session on visit to Zebra Culture facility and other research facilities in the Zoology Department for the Non Teaching staff on September 17, 2022 during the NATIONAL WORKSHOP on Career and Skill Enhancement for Non-teaching Staff under the aegis of DBT STAR College Scheme and IQAC.
5. Dr Sarita Kumar delivered a talk on 'An Overview of Animal Classification: Understanding Criteria' for the students of Department of Zoology, Punjab Agricultural University, Ludhiana, Punjab; Feb 22, 2022

6. Dr Sarita Kumar delivered a talk on 'Mendelian and Non-Mendelian Inheritance' for the students of Department of Zoology, Punjab Agricultural University, Ludhiana, Punjab; Feb 23, 2022.

C**. Outreach Activities - Visits**

Botany

1. Students visited Dhanaulti and Kanatal to gain knowledge about mushroom cultivation, ecology and herbarium.
2. Virtual Visit to Yakult Industrial Plant Sonepat
3. Students visited Mukteshwar and Nainital and studied ecology, herbarium preparation
4. Virtual Science SetuProgramme on Viruses and Immunity for UG students by eminent scientists from THISTI on March 17, 2021.
5. Students from Shivaji College were trained at the Mushroom facility on lignocellulosic waste as a valuable bioresource.
6. GD Goenka University Student workshop.

Physics

1. Organized an educational visit on May 31, 2022 for 10 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
2. Organized an educational visit on March 03, 2022 for 10 students to Electronic Materials and Devices Laboratory, Department of Physics & Astrophysics, University of Delhi, Delhi– 110007
3. Organized an educational visit on March 02, 2022 for 10 students to Micro-Fabrication Facility, Department of Physics & Astrophysics, University of Delhi, Delhi – 110 007
4. Organized an educational visit on 28 February 2022 (National Science Day) for 10 students to Inter University Accelerator Centre (formerly Nuclear Science Centre) Aruna Asaf Ali Marg, near Vasant Kunj, Vasant Kunj, New Delhi, Delhi – 110 067
5. Organized an educational visit on 28 February 2022 (National Science Day) for 10 students to National Physical Laboratory, Dr KS Krishnan Marg, Pusa, New Delhi, Delhi – 110 012
6. Organized an educational visit on 26 December 2021 for 10 students to Smart Materials and Devices Laboratory at Miranda House, University of Delhi, Delhi – 110 007

Zoology

1. A trip organized by the Department of Zoology under the aegis of DBT STAR college scheme to *Sulabh* International museum of toilets on April 18, 2022. Visit to IVF Centre
2. A trip was organized by the Department of Zoology under the aegis of DBT STAR college scheme to South end IVF Centre on April 05, 2022. students enjoyed learning about IVF processes.
3. Virtual tour of Aravalli Biodiversity Park on February 10, 2022.


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ACHARYA NARENDRA DEV COLLEGE

Appendix XII

Invited Lectures

Biomedical Science

S.No.	Invited Speaker	Affiliation	Title	Date
1	MsAnujaAgarwala	Senior Dietitian, AIIMS and Member, FSSAI	Kitchen is your Health tool	April 18,2022
2	Mr Vijay Kantharia	CEO, BioNEST-UDSC	Introduction to BioNEST-UDSC &Bioentrepreneurship	February 15,2022
3	Mr Shino James	IISER, Bhopal	Designing of a Novel Vector for One-Step Cloning & Expression in E.coli	January 28,2022

Botany

S.No.	Invited Speaker	Affiliation	Title	Date
1	MsAnujaAgarwala	Senior Dietitian, AIIMS and Member, FSSAI	Kitchen is your Health tool	April 18,2022
2	Prof. Manju M Gupta	Sri Aurobindo College, University of Delhi	From mycorrhizosphere to rhizosphere microbiome: The beautiful journey	June 23, 2021
3	DrDhanya Bhaskar, Associate Professor	Indian Institute of Forest Management, Bhopal	Biodiversity Conservation as if people and ecosystem matter'	October 28, 2021
4	Ms Deepti Gulati	National Institute of Food Technology Entrepreneurship and Management, Sonepat	Challenges and strategic solutions for breaking the bias for better nutrition and health outcomes	March 08, 2022
5	Prof. Mohammad Zahid Ashraf	Jamia Millia Islamia University, Delhi		March 23, 2022
6	Prof. Vishnu Bhat	Department of Botany, University of Delhi	Harnessing Apomixis to preserve Hybrid Vigour	April 20, 2022

Chemistry

S.No.	Invited Speaker	Affiliation	Title	Date
1	Mr Rahul Giri	Katayev Lab, University of Fribourg, Switzerland	Journey of an Alumni Episode -1 The Rise	October 16, 2021

2	MrSachinGiri	Gevorgyan Research Group, University of Texas, Dallas, United States	Journey of an Alumni Episode -2 The Rise	October 22, 2021
3	Ms Anmol Thanai	University of Manchester, United Kingdom	Journey of an Alumni Episode -3 The Rise	October 30, 2021
4	Dr Vipendra Kumar	University of Illinois, Urbana Champaign IL, USA,	Journey of an Alumni Episode -4 The Rise	November 26, 2021
5	MrVinod Singh Adhikari	Flying Officer in Indian Air Force	Journey of an Alumni Episode -5 The Rise	December 10, 2021
6	Ms Shreya Arora	Reviewer Selection Lead at Taylor & Francis, New Delhi	Ethics to Paper writing	April 19, 2022

Computer Science

S.No.	Invited Speaker	Affiliation	Title	Date
1	Prof. Madhu Vij	Department of Computer Science	Role of IT in Indian Banking System	July 14, 2021
2	Dr Sarika Jain	Assistant Professor, Department of Computer Science, NIT, Kurukshetra.	Semantic Intelligence- The next step in Artificial Intelligence	October 01, 2021
3	MrPranjal Mishra	Lead Data Scientist, CIMB Bank.	Explainable AI	October 04, 2021
4	DrNihar Ranjan Roy	Associate Professor, Sharda University.	Predictive Modeling using Python	October 08, 2021
5	MrBineet Kumar Joshi	Assistant Professor, Department of Computer Science, Swami Rama Himalayan University	Cisco Network Administration	March 03-04, 2022
6	Prof. Sanjay Kumar Dhurandher	Professor and Head in the Division of Information Technology, Netaji Subhas Institute of Technology (NSIT), University of Delhi, India.	Wireless Security Network	March 04, 2022

Electronics

S.No.	Invited Speaker	Affiliation	Title	Date
1	Prof. Bijoy Kumar Kuanr	Special Centre for Nanoscience, JNU, New Delhi	Magnetic Nano-structures based Microwave Monolithic Signal Processing Devices	April 19, 2022
2	Prof. Gaurav Sharma	Electrical & Computer Engineering, University of Rochester, New York	use of Physics U Math for Imaging Arithmetic	June 29, 2021
3	DrAmita Kapoor	Shaheed Rajguru College of Applied Science	Digital Transformation and it's impact on the future after Covid-19	July 7, 2021
4	Dr Ravinder Kaur	Deptt. Of Electronics, DeenDayalUpadhaya College, Delhi University	Creative Thinking and Entrepreneurial Skills	June 23, 2021

Physics

S.No.	Name of guest/ faculty	Designation	Title	Date
1	Dr. David Kocman	Department of Environmental Sciences, Jožef Stefan Institute (JSI) Ljubljana, SLOVENIA	Engagement of citizens in co-designing citizen science studiesin environmental epidemiology: Opportunities and challenges	February 24, 2022
2	Dr. Natasa Mori	Department of Organisms and Ecosystems Research, National Institute of Biology in Ljubljana, SLOVENIA	Aquatic biofilms as "bioengineers" for newly emerging pollutants removal	February 23, 2022
3	Dr. Rajesh Jalota	Energy and Extractive and Southwest Queensland Compliance unit, Queensland, AUSTRALIA	Land Management and Carbon Sequestration: Simple Solution to Somewhat Big Problems	February 26, 2022
4	Dr. Siva Karuturi	School of Engineering Australian National University, AUSTRALIA	Advanced Semiconductor and Catalytic Materials for Sustainable Hydrogen Generation	February 23, 2022
5	Prof. Michael W. Murray	University of Michigan Augusta University, USA	Environmental Indicators: Thoughts on Contributing to Sustainability and Equity in the Great Lakes Region and Beyond	February 24, 2022
6	Dr. Mukesh Kumar Thakur	J. Heyrovsky Institute of Physical Chemistry of the Czech Academy of Sciences, Prague, CZECH	The Role of the 2D materials for sustainable Growth and Future Optoelectronic Device Applications for	February 22, 2022

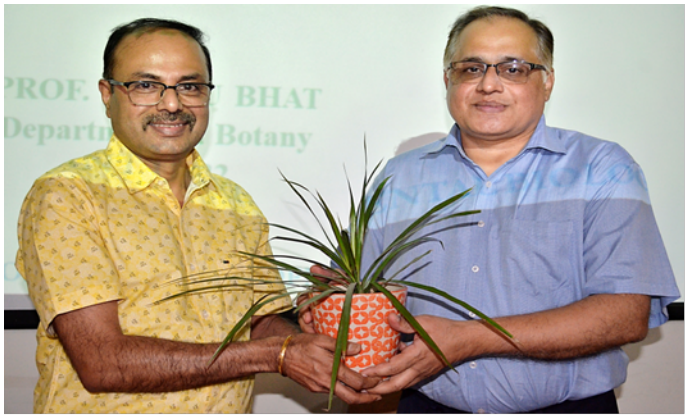
		REPUBLIC	environment	
7	Dr. Anjali Sharma Kaushik	Department of Physics, ARSD College, University of Delhi, New Delhi, INDIA	Low temperature operated efficient NO2 gas sensors for environmental monitoring	February 22, 2022
8	Ms. Parul Gupta	Practicing lawyer before the Supreme Court of India and National Green Tribunal, Delhi, INDIA	EIA As a Tool of Environmental Protection	February 28, 2022
9	Dr. Kajal Jindal	Department of Physics, Kirori Mal College, University of Delhi	In2Se3 thin films based high performance self-powered UV photodetector for environmental applications	February 25, 2022
10	Mr. Debadityo Sinha	Founder & Trustee, Vindhyan Ecology and Natural History Foundation and TEDx speaker, INDIA	Understanding 'Forests' Beyond Dictionary Meaning- The Disconnect Between The Science And Law	February 25, 2022
11	Prof. Chirashree Ghosh	Deptt. of Environmental Studies, University of Delhi, Delhi, INDIA	Nourish Ecosystems, Nurture Biodiversity, Enable Food and Enhance Resilience – Integrating Nature's potential	February 28, 2022
12	Dr Parminder Singh	Dronacharya Government College, Guru	An introduction to astronomical observations	March 29, 2022

Zoology

S.No.	Invited Speaker	Affiliation	Title	Date
1	Prof.Gaytha A Lagolis	Prof. of Environmental Policy, Bryant University, Rhode Island, USA	Syzygy or Sisyphus: The Future of Environmental Policy Making	February 22, 2022
2	Prof. Andy Purvis	The Natural History Museum, London, UNITED KINGDOM	Using biodiversity models to support the nature-positive transition	February 26, 2022
3	Prof.Rup Lal	NASI Senior Scientist Platinum Jubilee Fellow, The Energy and Resources Institute (TERI), INDIA	Hot springs located Atop the Himalayan Ranges at Manikaran and Kheer Ganga in Himachal Pradesh, India : Potential Sources of Microbial Diversity and Thermostable Enzymes	February 25, 2022

4	Dr Sanjukta Subudhi	DBT-TERI Center of Excellence in Advanced biofuels & Bio-commodities, The Energy and Resources Institute (TERI), Delhi, INDIA	Microbial intervention for advanced Biofuel production	February 28, 2022
5	Dr Bettina Sonntag	Research Department for Limnology, Mondsee, University of Innsbruck, AUSTRIA	Identification and monitoring of ciliated key protists in aquatic environments in the light of a sustainable environmental approach	February 25, 2022
6	Dr Mrityunjay Kar Suar	KIIT University	Incubating Ideas to Build Sustainable Environmental Technologies	February 26, 2022
7	Prof. Hardeep Kaur	Ramjas College, University of Delhi, Delhi, INDIA	Antifungal compounds: emerging environmental pollutants	February 22, 2022
8	Dr B. Anjan Prusty	Department of Natural Resources Management & Geo-informatics, Berhampur University, Odisha, INDIA	Criteria for Identifying Coastal & Marine Eco Sensitive Areas: A Revisit	February 24, 2022
9	Dr. Rachna Chandra	Department of Environmental Science - Forestry, Faculty of Agriculture, Sri University, Cuttack, Odisha, INDIA	Mangrove plantation activities in Kachchh, Gujarat	February 24, 2022
10	Dr Nageswar Rao Amanchi	University College of Science, Osmania University, Hyderabad, Telangana, INDIA	Ecosystem Restoration – Certain key approaches, principles and interventions	February 23, 2022
11	Dr Gayatri Kanungo	Senior Environmentalist, World Bank, USA	Nourish Ecosystems, Nurture Biodiversity, Enable Food and Enhance Resilience – Integrating Nature's potential	February 28, 2022
12	Dr Binita Dutta	Senior Business Analyst, Hyloris Pharmaceuticals, BELGIUM	Health care sustainability	February 27, 2022
13	Dr Charu Dogra Rawat	Ramjas College, University of Delhi, Delhi, INDIA	Overcoming challenges in the sustainable remediation of Hexachlorocyclohexane (HCH) dumpsite soils	February 22, 2022

14	Prof. Ram Kumar	School of Earth, Biological and Environmental Science, Central University of South Bihar, Gaya, Bihar, INDIA	Zero Hunger and climate mitigation: Constraints and possibilities	
15	Dr Vikas Sachdev	Department of Gastroentrology, AIIMS, New Delhi	ELISA	October 4, 2021
16	Dr RaunakDinker	School of Engineering &Science, G D Goenka University, Gurugram, Haryana, INDIA	Environmental mitigation through biological approaches	February 22, 2022
17	Dr Himender Bharti	Department of Zoology and Environmental Science, Punjabi University, Patiala, INDIA	Anthropocene: A misplaced trust in Ecological Utopia	February 22, 2022
18	Dr Utkarsh Sood	The Energy and Resources Institute (TERI), Delhi, INDIA	The role of genomics in resolving classification anomalies of bacterial genera	February 26, 2022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TARUMITRA- The Botanical Society
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The Women Empowerment Society
LIVING IN SUNSHINE

Appendix XIII

This year College has 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 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).

AUM
AUBURN UNIVERSITY AT MONTGOMERY

MEMORANDUM OF UNDERSTANDING ON ACADEMIC CO-OPERATION

Between

Auburn University at Montgomery

And

Acharya Narendra Dev College, University of Delhi, New Delhi, India

Auburn University of Montgomery, Alabama, USA and Acharya Narendra Dev College (ANDC), University of Delhi, Govindpuri, Kalkaji, New Delhi, 110019, India recognising the benefits to their respective institutions desire to form a Memorandum of Understanding (MoU) to promote friendship and to co-operate in a mutually beneficial association, have agreed that:

INDIA NON JUDICIAL

Government of National Capital Territory of D

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सत्यमेव जयते

Certificate No.	:	IN-DL19098820737397T
Certificate Issued Date	:	04-Sep-2021 11:05 AM
Account Reference	:	IMPACC (IV)/ dl847003/ DELHI/ DL-DLH
Unique Doc. Reference	:	SUBIN-DLDL84700333930168571561T
Purchased by	:	ACHARYA NARENDRA DEV COLLEGE
Description of Document	:	Article 5 General Agreement
Property Description	:	Not Applicable
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	NATIONAL INSTITUTE OF IMMUNOLOGY
Second Party	:	ACHARYA NARENDRA DEV COLLEGE

ACHARYA NARENDRA DEV COLLEGE
Preparing for the future...
आचार्य नरेंद्र देव कॉलेज
तैयारी भविष्य की...
University of Delhi दिल्ली विश्वविद्यालय | NAAC accredited A Grade

Ref./ संदर्भ: ANDC
Dated/ दिनांक:

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding has been made and executed at Delhi on September 09, 2021

BETWEEN

Entrepreneurship Cell School of Open Learning (herein after referred to as "Entrepreneurship Cell, School Of Open Learning , University Of Delhi") , University of Delhi, represented by Mr. Anurag Mittal, engaged in facilitating Skill Development and Entrepreneurship ecosystem through different interventions of training, research, mentoring, business and career coaching, vocational programs etc. with its campus at 1st Floor, School of Open Learning, 5 Cavalry Lines, University of Delhi-110007, North Campus for cooperation on providing Entrepreneurial services through Entrepreneurship Cell (hereafter called the Party of the First Part or the First Party);

AND

Acharya Narendra Dev College, University Of Delhi represented by Prof. Ravi Teteja (hereinafter referred to as "ANDC", which expression shall, unless it be repugnant to the context or meaning thereof be deemed to mean and include its successors and assigns) of the Second Part; (thereafter called the Party of the Second Part or the Second Party) having its registered office at Govindpuri, Kalkaji, New Delhi- 110019.

Anurag Mittal
Incharge - E Cell SOL DU
Entrepreneurship Facilitation Center
Room no.118, 1st Floor, 5 Cavalry Lines
North Campus University of Delhi

Address: Govindpuri, Kalkaji, New Delhi 110019 URL: http://andcollege.du.ac.in
पता : गोविंदपुरी, कालकाजी, नई दिल्ली 110019 | E-mail: principal@andc.du.ac.in
Phone: 011-26294542, 011-26293224 | Fax: 011-26294540

Virtual Labs
An initiative of Ministry of Education under the National Mission on Education through ICT

Virtual Labs
An MoE Govt of India initiative

Wireless Research Lab, Bharti School of Telecom
Indian Institute of Technology Delhi, Hauz Khas, New Delhi-11 0016. Tel: 011-26582050
www.vlab.co.in

Ref. No.: VLABS/IITD/NCS

Date: 13-09-2021

To,
The Principal,
Acharya Narendra Dev College,
Kalkaji, New Delhi

Sub: Virtual Labs Nodal Center

With reference to your Expression of Interest for Virtual Labs, it gives me immense pleasure to designate your Institute as a Nodal Center for Virtual Labs. As nominated by you, **Dr. Sumit Sahni** has been accepted to act as the Nodal Coordinator from your Institute. This approval is valid up to 31st December 2021. Subject to the following Terms and Conditions and any subsequent directives as issued by MoE from time to time:

1. Approved status of AICTE/STEB/UGC is mandatory for your college.
2. The necessary infrastructure (dedicated space having personal computers with 1Mbps broadband internet connectivity) to be maintained at your own cost for Virtual Labs.
3. Nodal centers will get operational technical support.
4. Students are not to be charged any extra fee for providing Virtual Labs facility for their usage.
5. Nodal Coordinator should attend the meeting held at IIT Delhi as per schedule and a semester wise report of V Labs usage and feedbacks by the faculty members and students should be submitted.
6. Strict adherence to the standard lab procedures and cyber security laws needs to be followed.
7. Any violation or the above will result in automatic cancellation of Nodal Center status for your college

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