

TERI SCHOOL OF ADVANCED STUDIES

PLACEMENT BROCHURE

2023

M.Sc. Biotechnology



Chancellor's Message

Established as an institution of higher learning, TERI School of Advanced Studies aims at creating knowledge and human capacity that enables transition towards a more sustainable world.

The foundation of the institute was laid by the Energy and Resources Institute a not-for-profit, independent research organization globally known for its contribution to scientific and policy research in the realm of energy, environment and sustainable development.

As a leader in sustainability education in India and abroad, TERI School of Advanced Studies (TERI SAS) has been transforming students into sustainability professionals who bring sustainable solutions to the problems that hinder growth in rapidly developing countries like ours.

With the help of an interdisciplinary curriculum taught by a multi-disciplinary faculty, the institute imparts world-class education in domains such as climate change, energy, environment, urban development, policy, water resources, biotechnology, geoinformatics and sustainability management among others.

A series of niche programmes offered by the institute that cater to the demands of the industry and are subjected to constant amendments which enable our students to face and resolve issues with ease.

The feedback from the academic peers, employers and other stakeholders always motivate us to work towards improving our teaching methodology and curriculum.

Whether it's the organizations of global relevance such as the United Nations or the organizations that work to bring change at the grass-root level, our alumni are contributing in every aspect of life across continents to make earth more sustainable for future generations.

Therefore, I welcome you all to hire our students who are competent leaders and will be great assets to organisations.



Dr Shailesh Nayak,
Chancellor, TERI SAS



Vice-Chancellor's Message

Dear Development and Industry Partners,

With an aim to create empowered professionals and thought leaders that better aligns the sustainability considerations in pursuit of economic growth and human welfare, TERI School of Advanced Studies (TERI SAS) is a unique institution of higher learning and cutting edge research.

The academic programmes at the TERI SAS have been designed by keeping in mind the challenges of rising population, already depleting and over-exploited natural resources, and opportunities for sustainable development. Over the years, our alumni engaged in diverse domains of various national and international organizations have been the ambassadors of our vision of creating knowledge for sustainable development in both public and private sectors.

The state-of-the-art research by our faculty members helps us to keep our programme curriculum cutting edge, interdisciplinary and solution-oriented. TERI SAS has been a pioneer in sustainability education and it's the unique combination of our multidisciplinary faculty and interdisciplinary curriculum that separates us from the rest of the institutes.

The curriculum ensures that the students inculcate and imbibe the problem-solving attitude through regular engagement with research projects, industry exposure and field visits.

TERI SAS believes in continuously adapting to the change taking place around the world. The feedback from the academic peers at the domestic and international levels, from employers of our alumni and other stakeholders including our students help us to make key amendments in our curriculum and teaching pedagogy.

The multicultural setting comes naturally to TERI SAS as we have students from the diverse regions across India with international students who continuously exchange ideas and experiences, making the institute truly global.

We are certain that you will find our graduates to be competent leaders who adhere to constructive engagements with analytical skills, well versed with contemporary developments in their domains and have solution-oriented approaches. Our graduates will be assets to organizations acclaiming on sustainability.

I welcome you all for the campus recruitment.

Thanking you and best regards,



Prof. Prateek Sharma
Vice-Chancellor(Acting), TERI SAS

About TERI SAS

TERI SAS (earlier TERI University) was established to disseminate knowledge arising from research and development undertaken by The Energy and Resources Institute (TERI), a not-for-profit, independent research institute recognized globally for its contribution to scientific and policy research in the realms of energy, environment, and sustainable development.

In 1999, the University was granted the 'Deemed to be University' status by the University Grants Commission (UGC) and notified vide the Ministry of Human Resources Development, Department of Education, Government of India, notification no. F.9/19/95-U-3, dated October 5, 1999. TERI SAS is also accredited by National Assessment and Accreditation Council (NAAC) with grade "A".

TERI SAS academic programmes are envisioned to provide students with a holistic perspective of the subjects offered and encourage interdisciplinary learning. The University aspires to be an institution of advanced learning which meets the needs of a rapidly growing nation. The University uses modern pedagogical tools, richly supplemented by comprehensive field trips, live industry projects, and hands-on applications.

Administration

The University's Board of Management is responsible for its overall administration and control. All aspects of academic policy are under the purview of the Academic Council, chaired by the Vice Chancellor, which approves curricula, courses and examination results.

ACADEMICS

Since its inception, the wide array of academic programmes offered by TERI SAS have been related to sustainable development and structured around four thematic areas—biotechnology, regulatory and policy aspects, energy and environment, and natural resources.

The University is a first-of-its-kind university in India to dedicate itself to the study of environment, energy, law, water resources, business sustainability and natural sciences for sustainable development.

INFRASTRUCTURE

TERI SAS provides well-equipped laboratories, advanced computer hardware and software, video-conferencing facilities and access to South Asia's most comprehensive library on energy and environment.

Green Campus

Spread over two acres, TERI SAS Green campus comprises of an administrative block, an office block, a convergence and a hostel block. The green campus provides a setting that enhances learning while simultaneously showcasing the concept of modern green buildings including insulation of external walls, terrace insulation, Hunter Douglas louvers, solar water heating system, waste water recycling, rainwater harvesting, solar rooftop system, LED lights and a windmill.

The Academic Council

Chairperson

Prof. Prateek Sharma

Professor & Vice Chancellor (Acting), TERI SAS

Deans

Prof. Ramakrishnan Sitaraman

Professor & Dean(Academic)

Prof. Shaleen Singhal

Professor & Dean(Research & Partnerships)

Prof. Anandita Singh

Professor & Dean(Student's Welfare)

Heads of the Departments

Dr Sudipta Chatterjee

Prof. Vinay Shankar Prasad Sinha

Prof. Naqui Anwer

Dr Sukanya Das

Dr Chaithanya Madhurantakam

Professors

Prof. Arun Kansal

Two Associate Professors from Departments

Dr Chander Kumar Singh

Dr Smriti Das

Two Assistant Professors from the department by rotation of seniority

Dr. Shruti Sharma Rana

Dr Anu Rani Sharma

Nominee by the Vice Chancellor

Prof. Shreekant Gupta

Professor, Delhi School of Economics, University of Delhi

Prof. P.S.N. Rao

Director, School of Planning and Architecture

Prof. Sagnik Dey

Institute Chair Professor, Centre for Atmospheric Sciences, Indian Institute of Technology Delhi

Prof. T C Kandpal

Professor, Centre for Energy Studies, Indian Institute of Technology Delhi

Dr. Vivek Suneja

Faculty of Management Studies, University of Delhi

Prof. Suresh Jain

Professor, IITD

Co-opted Members

Mr. Manoj Chugh

President – Group Public Affairs & Member of the Group Executive Board Mahindra & Mahindra Ltd

Mr. Rahul Mittal

Director, International Tractors Ltd.

Dr Sabhyata Bhatia

Staff Scientist VII, National Institute of Plant Genome Research, New Delhi

Mr. Shubhashis Dey

Director – Climate Policy Program, (Low Carbon Development, Air Quality & Climate Finance), Shakti Foundation

Mr. Niraj Sharma

Chief Scientist, TPE Division, CSIR-Central Road Research Institute

Dr Bidyut Kumar Bhadra

Dy. General Manager, Regional Remote Sensing Centre-North, National Remote Sensing Centre, Indian Space Research Organisation

Dr Madhusudan Sau

Executive Director, R&D Centre, Indian Oil Corporation Limited

Mr. Sudhir Vadehra

Ex-Advisor, Ministry of Power; and Executive Director, REC (Retd)

Controller of Exams

Prof. Shashi Bhushan Tripathi

Secretary

Mr. Kamal Sharma

Registrar (Officiating), TERI SAS

Board of Management

Chairman

Prof. Prateek Sharma
Professor & Vice Chancellor (Acting),
TERI SAS

Deans

Prof. Ramakrishnan Sitaraman
Professor & Dean (Academic), TERI
SAS

Prof. Shaleen Singhal
Professor & Dean (Research &
Partnerships), TERI SAS

Three eminent Academicians nominated by Chancellor

Prof Basabi Bhaumik
Former Professor, IIT Delhi

Dr Sachin Chaturvedi
Director General, Research and
Information System for Developing
Countries (RIS)

Dr Swati Basu
Former Director, National Centre for
Medium Range Weather Forecasting
and Former Scientific Secretary, PSA's
Office, Government of India

Nominee of Sponsoring Society

Dr V.P. Singh
Regional Rep for South Asia,
International Centre for Tropical
Agriculture

Prof. Nitya Nanda
Director, Council for Social
Development

Mr. O P Agarwal
Former IAS and former CEO of WRI

Two teachers (from Prof and Associate Prof)

Prof. Anandita Singh
Professor, TERI SAS

Dr Sukanya Das
Associate Professor, TERI SAS

Secretary

Mr. Kamal Sharma
Registrar (Officiating), TERI SAS

ACADEMICS

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Department of Natural and Applied Sciences

Quality of life depends on the quality and quantity of natural resources available for use in equitable ways. The world today faces an unprecedented challenge of sustainability. Finding a balance between meeting the needs of human population and maintaining integrity of nature around us is the foremost question of our times. It is imperative to understand how natural processes and systems work around us and how to best use them in pursuit of this balance. The Department of Natural and Applied Sciences (DNAS) at TERI SAS is established to impart training for engaging with the questions of natural resource management in a scientifically rigorous manner. It houses faculty members from a diverse academic disciplines with a focus on applied research for informed decision making.

DNAS offers four distinct interdisciplinary masters programs in Biotechnology, Climate Science and Policy, Environmental Science and Resource Management, and Geoinformatics; and two transdisciplinary Ph.D. Programs in Bioresources and Biotechnology, and Natural Resource Management.

Students pursuing their Master's / Doctoral programme at DNAS are exposed to an academically rigorous and interdisciplinary learning environment with a significant emphasis on laboratory work and engagement with contemporary debates, emphasizing exploration and creative thinking and application as essential ingredients of originality in research and learning.

Department of Policy and Management Studies

The primary challenge of the human being is to improve quality of life across generations, an objective now widely recognized as Sustainable Development. This challenge necessitates numerous interventions concerning each of its components: environmental, social and economic. These interventions range from eradication of hunger and poverty to reduction in inequality; from the provision of quality education, good health, decent work environment, water, sanitation, affordable and clean energy to fostering gender equality; from economic growth to effective institutions; from responsible consumption and production to taking urgent actions to combat climate change.

The Department of Policy and Management Studies (DoPMS) at TERI School of Advanced Studies (TERI SAS) aims to contribute to theoretical and empirical enquiry towards informed prescriptions, implementable policies, sustainable practices and management through research, teaching and training. The continued research in sustainability for the business is also one of the key concerns of the Department.

Faculty of the Department have disciplinary backgrounds in Anthropology, Economics, Population Studies, Sociology, Finance & Accounting, Corporate and Commercial Laws, Public Health, Strategy, Business Sustainability, Circular Economy Finance, Climate Finance, Development Studies and Public Policy. Such disciplinary enables the promotion of multi-disciplinary research and learning at the economy-society-ecology interface. The faculties are engaged in active research in their disciplines as well as within the broad theme of sustainable development. This is reflected in their publications, sponsored projects, consultancies and training programmes and supervised research. The faculty regularly engage with the scientific community through seminars and conferences, participate in different forums as experts or resource persons, and engage with the general public through their lectures, print and digital media.

Department of Sustainable Engineering

Over the past half century, the global community has been debating the mode of economic growth, amid challenges of environmental degradation, energy transition and climate change. India among the several emerging economies, though at crossroads, it has chosen a trajectory of sustainable development for ensuring inter-generational equity and inclusiveness in its growth journey. As India is growing economically amid an increased pace of urbanization, the burden on resource utilization and management has increased Substantially. Two prominent sectors such as energy and urban development facing challenges which are bound to increase due to climate change. Addressing these challenges will require trained professionals who can assess the problems, think critically by integrating multiple sectors and create evidence-based solutions. The focus of Department of Sustainable Engineering (DSE) at the TERI SAS is to develop a cadre of professionals having requisite knowledge and skillsets towards addressing the current and envisaged challenges faced by humanity by promoting scientific, technological and policy innovations for strengthening local, regional, and global development agendas.

DSE offers MTech and doctoral programmes in areas of Renewable Energy Engineering & Management (REEM), and Urban Development Management (UDM). The Department is cognizant of the complex environmental, socio-economic, and political challenges that require an integrative approach towards engineering and sustainability. The DSE encourages collaboration with relevant stakeholders including industry, government, academic & research institutions, and multi-lateral organizations to deliver practice-informed research and teaching.

The curriculum of programmes offered by DSE is an eclectic mix of foundational and advanced courses which promotes both critical and creative thinking. The students at DSE are drawn from diverse branches of engineering, science, architecture, and planning which cultivates robust peer learning. The faculty at the DSE has wide experience and expertise across multiple domains, touching upon the two main themes of the Department – renewable energy and urban development.

Coca-Cola Department of Regional Water Studies

The Coca Cola Department of Regional Studies was created in 2014 with a mission to create a cadre of water professionals who can provide systematic solutions to enhance water security. The water science and governance programme aims to prepare regional water champions who can address water problems in a holistic manner that encompasses both the science of water management and the governance and an enabling policy environment with a healthy blend of theory and practice. The teaching programme focuses on cross cutting issues of water resources through science, engineering, legal, socio-economic and institutional dimensions.

The Department offers two Master's level programmes and Ph.D. programme. The M.Sc. programme in Water Science and Governance is an interdisciplinary program with emphasis on development of social, economic, institutional and governance perspectives. The water professionals graduating from TERI SAS are equipped to examine water issues in a trans-boundary and cross-cultural framework transcending environmental science, social, economic and legal discourses. The M. Tech programme in Water Resources Engineering and Management integrates engineering and technological theories with socio-economic principles. The courses address the technical, social, economic, legal and political dimensions of water. Interdisciplinary in its scope and objectives, the programme prepares students for a rewarding and challenging career in water resources management.



COLLABORATIONS

Stressing the importance of the international perspective in its programmes, TERI SAS has entered into Memorandums of Understanding (MoUs) with several international universities aimed at facilitating a mutually beneficial exchange of students, faculty, knowledge, resources, and ideas.

Organisation with which MoU is signed

Freie University, Berlin

The Heller School for Social Policy and Management,
Brandeis University

Himalayan University Consortium Charter University of
Iceland

Sambhram Institute of Technology, Bangalore & TERI,
Bangalore

The University of the West Indies, Kingston, Jamaica

Environment Protection Training and Research Institute,
Telangana, India

Karl-Franzens-University, Graz; Ca'Foscari University,
Venice; Leipzig University, Germany; Utrecht University,
Netherlands; Basel University, Switzerland; Hiroshima
University, Japan; Stellenbosch University, South Africa

Gurugram Metropolitan Development Authority, Haryana

Institute for Future Cities, University of Strathclyde,
Glasgow, United Kingdom

Kwame Nkrumah University of Science and Technology,
Kumasi, Ghana

Future Himalaya Institute (FHI), Kathmandu, Nepal

Faculty of Graduate Studies, University of Sri
Jayewardenapura, Sri Lanka

National Institute of Disaster Management (NIDM), India

Purbanchal University, Nepal

The University of Victoria, B.C., Canada
Deakin University, Australia

SM Sehgal Foundation, Gurugram

CPWD, New Delhi

University of Science, Engineering and Technology,
Gambia

Lomonosov Moscow State University

Linnaeus University, Sweden

Mahindra & Mahindra Ltd.

Humboldt University, Berlin

EKI-Energy Services Limited

Canvest Infracapital Inc., Canada

DHAN Academy, Tamil Nadu

Centre for Public Policy Research, Kerala

Emerson Electric Co (I) Pvt. Ltd, Pune, Maharashtra

National Bureau of Plant Genetic Resources

University of Rhode Island, USA



INFRASTRUCTURE

TERI SAS provides the best equipment and instruments, which includes a state of the art computer hardware and software, well-equipped laboratories, video-conferencing facilities and access to South Asia's most comprehensive library on energy and environment.

Green Campus

Spread over two acres, TERI SAS Green campus comprises of an administrative block, an academic block, a convergence and a hostel block. The green campus provides a landscape that enhances learning while simultaneously showcasing the concept of modern green buildings including insulation of external walls, terrace insulation, Hunter Douglas louvers, solar water heating system, waste water recycling, rainwater harvesting, solar rooftop system, LED lights and Wind turbines.

Laboratories

TERI SAS laboratories are equipped with advanced equipment and facilities to aid and stimulate research.

The different laboratories at TERI SAS are:

Environmental Monitoring Laboratory

The laboratory has been created with the objective of providing a facility with all the basic equipment required for the analysis of environmental samples (soil, waste, water, and air). It caters to the interdisciplinary application of research to all the master's students (science-based) of the Deemed university. This laboratory facility is common for M.Sc./M.Tech. (ESRM, CSP and WSG) programs

Combustion Lab

The combustion lab was established in 2009 with the initial funding received from DST project and MNRE projects. It is a small lab however equipped with instruments used for emission and thermal efficiency testing. Primarily, we conduct experiments based on internationally accepted protocols viz, water boiling test (WBT) and kitchen performance test (KPT) in the above-mentioned lab. The hood methodology is used to capture and quantify the various products of incomplete combustion.

Environment Lab

The laboratory supports master's level experiments pertinent to the laid curriculum. The lab is equipped with instruments required for environmental analysis (soil, water, and air). The laboratory is capable to perform analysis on drinking water, wastewater, surface and groundwater, soil, and sediments, including air quality monitoring, and basic microbial analysis. Laboratory also supports various training programs offered by the university in the associated fields. This laboratory facility is common for M.Sc. (ES, WSG, and CSP) programs.

Centre of Excellence in Thermal Energy Storage

The laboratory is equipped for research on new thermal storage system development for sub-ambient, low, and medium temperature applications and characterizing storage material properties for optimal system design.



Heat transfer laboratory

The laboratory provides hands-on training to students to understand various heat transfer modes, devices and to quantify their characteristics parameters or properties.



Power Systems laboratory

The lab provides fundamental experimental knowledge on different equipments used in electrical power system at various loading conditions and to measure their characteristics.

Hybrid Micro Grid (HMG) laboratory

The lab houses solar PV system, wind turbine, battery energy storage and connected together to develop a hybrid micro grid. The research facility is used for carrying out power flow experiments.

Energy Simulation Laboratory

The lab is equipped with the state of the art software used in Renewable Energy industry. The lab provides in-depth understanding on design, simulation, financial analysis and optimization of various renewable energy technologies for plant/system design and other applications.

Biofuel and Waste Utilization Laboratory

The lab is used to conduct research experiments on the combustion process, fuel properties, biomass conversion, and pyrolysis.

Solar Energy Laboratory

The lab is equipped with outdoor and indoor experimental facilities to conduct experiments on the characterization of solar photovoltaics modules, radiation measurement, and performance analysis of various solar thermal devices/systems.



Geoinformatics Laboratory

The TERI SAS geoinformatics laboratory is well equipped with state-of-the-art equipment such as state-of-the-art computers (workstations), a scanner, printer, plotter, navigation devices, infrared thermometers, etc. It has license for high -end commercial software's like ERDAS Imagine, LPS, ArcGIS, MIKE, GMS, and WEAP along with other advanced support system's mechanism. The laboratory is also equipped with web publishing tools like ArcGIS Advance and ArcIMS Servers. The laboratory is **also fitted with various open-source** geospatial softwares to expose our students to the powerful open-source environment.

The laboratory holds a good repository of geospatial information in both digital and hard formats. The Geoinformatics laboratory of the Department of Natural and Applied Sciences of TERI SAS has a solid network with several research establishments and Universities working in Geoinformatics and other associated fields both within and outside the country. We also support R&D activities of various centres of The Energy Resources Institute (TERI) branches located across the country.



Analytical and Geochemistry Laboratory



The analytical and geochemistry lab caters the needs for research in understanding the earth sciences problems and providing solutions to these problems. The researchers in the laboratory are currently engaged in understanding the natural occurrence of Arsenic, Fluoride and Uranium in groundwater. The lab also has developed prototype nano-materials to remove such geogenic contaminants from groundwater to provide safe drinking water. The lab has established linkages to Lamont Doherty Earth Observatory, Columbia University; Dept. of Engineering,

Massachusetts Institute of Technology, Stanford University. The lab also has developed linkages with institutions in India such as IIT Kharagpur, IIT Guwahati, Jawaharlal Nehru University, SPCB Bihar, Drinking Water Supply and Sanitation, Punjab, Board of Research in Nuclear Sciences etc. The laboratory houses several water field testing kits, flame photometer, double beam spectrophotometer, LED-Fluorimeter, Radiation Survey Meter, Air-dry Oven, Sonicator, pH meter, Muffle furnace, Ion selective Electrodes, Conductivity meter etc.

Biotechnology Laboratory

The Biotechnology Laboratories at TERI SAS are equipped for teaching and research in Biotechnology. The laboratories harbor both basic as well as sophisticated equipment used in modern biotechnology research. In addition to these, the Bioinformatics laboratory is equipped with a high capacity server, workstations and dedicated computers with advanced software such as MATLAB, GCK, PAUP and MacVector. There are two laboratories for M.Sc. teaching and two research laboratories. Furthermore, the students also have access to TERI's research laboratories at Gwal Pahari.



Some of the major equipment installed in the laboratories are listed below:

- | | | |
|--------------------------|-----------------------------|--|
| ●Real time PCR | ●Centrifuges | ●Spectrophotometer |
| ●Zeta Potential Analyzer | ●Incubator Shakers | ●SE 600 Ruby complete, 2D, Vertical Gel unit |
| ●Refrigerators | ●Thermal cyclers | ●2D Gel Electro power supply, EPS 601, GE |
| ●Microscopes | ●EVOX-XL Microscope | ●Gel Doc system XR |
| ●Laminar Flows | ●Nanodrop Spectrophotometer | ●Ice Franking Machine |
| ●Power Pack/Power supply | ●Gene Pulser X Cell | ●Growth Chamber GC - 100 |
| ●BOD Incubator | ●HB-1000 Hybridization Oven | ●Electronic Balances |
| ●Deep freezers -20°C | ●Stereo Zoom Microscope | ●Deep Freezer -80°C |
| | | ●Solar PV Simulator |

Library

One of the key infrastructures of TERI SAS is its well developed and centrally organised library. The library has a number of electronic services and an ever-wider range of resources in order to support teaching, learning and research. The Library also engages in partnership initiatives with academic colleagues and national and international universities. The services are offered electronically through a web-enabled integrated digital information system.



M.Sc. Biotechnology



The M.Sc. Plant Biotechnology programme was started in 2008 and restructured to M.Sc. Biotechnology in 2021 at TERI School of Advanced Studies (TERI SAS) as an interdisciplinary programme designed to train students to use the available biological techniques such as genetic manipulation, molecular biology, biochemistry and bio-informatics in the welfare and development of plants, agriculture and biotechnology in general. The programme aims on instilling scientific temperament, technical skill-set and inducing logical thought process which is fundamental for research. Along with the research-oriented subjects, the students are also trained in applied mathematics and statistics to enable them to perform a better analysis of their experimental results. Also, the subjects such as bioethics and plant biotechnology management and regulatory issues are included into the course structure to make the students well aware about the legal and ethical aspects of biotechnology and related research. The students of this programme acquire interdisciplinary expertise around a strong biotechnology core. The course encourages research orientated thinking that develops strong analytical and integrative problem-solving approaches.

PROGRAMME

Programme outline

Since the programme is designed in an interdisciplinary manner, the students develop a diverse set of skills that opens up various sectors for them. The key domains of the course outcome include forensics, plant breeding and development, agricultural development, research and development, bioinformatics, science education and policy, regulations and management and a lot more.

Year	Courses	Credits
1st Semester	7 core courses of 2-7 credits each, and 2 core audit courses	21
2nd Semester	7 core courses of 2-7 credits and 1 course of 2 credits in the area of specialisation (Microbial/ Plant biotech)	23
3rd Semester	4 core courses of 2-7 credits and 1 course of 3 credits in the area of specialisation (Microbial/Plant biotech)	18
4th Semester	Major project	16

SEMESTER 1

COURSE TITLE	TYPE
Applied mathematics	Core
Bioanalytical techniques	Core
Bioinformatics and computational biology - Part I	Core
Biotechnology laboratory - Part 1	Core
Communication Skills and Technical Writing	Core
Conceptual foundations of molecular biology	Core
Plant and Animal Biotechnology	Core
Principles of Biochemistry and Biophysics	Core
Principles of genetic engineering and recombinant DNA technology	Core

SEMESTER 3

COURSE TITLE	TYPE
Bioethics, IPR and Regulations in Biotechnology	Core
Bioprocess Engineering and Environmental Biotechnology	PE
Biotechnology Laboratory - Part 3	Core
Molecular Genetics for Plant Functional Genomics: Principles and Practice	PE
Gene Expression Analysis and Transcriptomics	Core
Proteomics and Protein Engineering	Core

SEMESTER 2

COURSE TITLE	TYPE
Biotechnology Laboratory - Part 2	Core
Conservation Genetics and Genomics	Core
Genome Structure and Diversity: Concepts and Methodologies	Core
Introduction to Nanobiotechnology	Core
Microbial Pathogenesis	PE
Molecular Cell Biology - From Genes to Communities	Core
Molecular Microbiology and Immunology	Core
Molecular Plant Physiology and Metabolism	PE
Statistics for The Life Sciences	Core

SEMESTER 4

COURSE TITLE	TYPE
Major project	Core

INFRASTRUCTURE FOR BIOTECHNOLOGY

The labs at TERI SAS and its parent organization, The Energy and Resources Institute (TERI), are well equipped to enhance the research skills of the students. The theoretical knowledge imparted by the faculty is well complemented by the hands-on training to mold the students to give their best output in whichever field they go. The infrastructure and facilities where the research programmes are undertaken are detailed as follows:

Laboratories at TERI SAS

- Teaching Laboratories — Two
- Research Laboratories — Three
- Plant Growth Room — One
- Plant Tissue Culture Facilities
- Area for Biosafety Level Two — One
- Net-house for Transgenic Crops (TERI Gram)
- Computer Laboratory for Bioinformatics — One

Laboratories at the India Habitat Centre and at TERI Gram

- Micro-propagation Technology Park
- Fermentation Facility
- TERI-Deakin University Nanotechnology Centre at TERI Gram

FACULTY PROFILE



Dr. Anandita Singh

Dean (Students Welfare) and Professor Department of Biotechnology
Ph.D.

(Jamia Hamdard University, New Delhi)

Subjects: Plant Developmental Biology and Crop Improvement



Dr. Chaithanya Madhurantakam

Associate Professor, Department of Biotechnology Ph.D.

(IIT, Kharagpur)

Subjects: Structural Biology and Protein Engineering



Dr. Prateek Sharma

Vice Chancellor and Professor Department of Sustainable Engineering

Ph.D.(IIT, Delhi)

Subjects: Environmental Engineering



Dr. Ramakrishnan Sitaraman

Professor, Department of Biotechnology Ph.D.

(University of Alabama, Birmingham)

Subjects: Microbial Genetics and Pathogenesis



Dr. Shashi Bhushan Tripathi

Associate Professor, Department of Biotechnology Ph.D.

(Berhampur University, Orissa)

Subjects: Molecular Breeding and Germplasm Characterization



Dr. Vidhi Madaan Chadda

Assistant Professor, Department of Policy and Management Studies

Ph.D.

(Faculty of Law, University of Delhi)

Subjects: Law

STUDENTS' PROFILE



Manika Bhatia

Graduation – Bsc life science, Hansraj college, University of Delhi

Research Interests – Molecular Genetics and Breeding, Single Nucleotide Editing, Genome Editing, Transgenic Preparation, CRISPR-Cas9, Expression Analysis Studies, Marker Assisted Breeding and Selection, Gene Mapping, Computed Aided Drug Designing and Molecular Docking, Phylogenetic Analysis, Crop Improvement, Proteomics, Genomics, Genotype by Sequencing, Next Generation Sequencing and Plant tissue culture.

Work experience/ projects/ trainings –

Hands-On Training in Molecular Biology Laboratory at TERI School of Advanced Studies under the guidance of Prof. Anandita Singh: 1-07-2022 to 15-08-2022

Summer Hands-on Training on “In silico Protein Docking and Drug Designing” at Gargi College, University of Delhi, under the guidance of Dr. Sumit Raj: 23-06-2022 to 22-07-2022

DST SERB training program at Gujarat technological University, titled “Study of anticancer potential of herbal compounds through cell line studies”: 3rd to 28th January, 2022.

Research Internship at National Dairy Research Institute, Karnal Under the supervision of Dr. Sachin Kumar in Rumen Biotechnology Lab: JAN-APRIL 2021
Project Governing the effect of different biofertilizers on the growth of plants, Hansraj College: 2019

Basic Biotechnology Research: National Science Center (Delhi) 2017-2018



Mehr Munjal

Graduation – Bsc (Hons) Biochemistry, Institute of Home Economics, University of Delhi

Research Interests – Bioinformatics (Molecular docking and drug designing), Next Generation Sequencing, biofuels, Industrial biotechnology Intellectual property rights and patent law, ESG.

Work experience/ projects/ trainings –

Internship in bioinformatics, TERI School of Advanced Studies on application of various software through Galaxy and using ‘Barcode-splitter’ for demultiplexing and ‘FastQC’ for quality analysis of raw reads obtained from Next Generation Sequencing data.

Course on The A to Z of ESG - Environmental & Social Governance, A Perspective for Businesses on How to Manage ESG - Why it matters to Financial Performance and to the Economy. - Udemy, 2022

Course on Climate Risk Management – Udemy, 2022

IPR Online Course - Federation of Indian Chambers of Commerce & Industry, September - November 2022 (ongoing)

Projects associated with Delhi University –

- Analysis of enzyme kinetics of Acid phosphatase, 2020
- Analysis of beetroot as pH indicator, 2019



Afreen Siddiqui

Graduation – B.Sc. (H) Biotechnology, Integral University, Lucknow.

Research Interests – Nanotechnology, Structural and Molecular Biology, Immunology, Microbial Genetics, Bioinformatics, Microbial Biotechnology.

Work experience/ projects/ trainings – Training on topic "synthesis of selenium nanoparticle using air-borne fungus", Integral University, Lucknow.

Winter school on Advanced applications of Nanotechnology for food and environment, TERI DEAKIN.

Webinar: 1) Decoding complexity of cancer.

2) Multidimensional implications of SARS-CoV-2 Proteins and Polyproteins.

Biotechnika course "Drug discovery & genome editing using CRISPR".



Diyotima Karfa

Graduation: B-tech in Biotechnology, Heritage institute of technology, Kolkata.

Research Interests – Sustainable biotechnology in health care, Sustainable agriculture, Industrial biotechnology, ESG, Biosensors and Bio-Monitoring, Bioremediation, Biofuels, IPR, Bioinformatics - Molecular docking and data interpretation, Phylogenetic Analysis, Next Gen Sequencing.

Work experience/ projects/ trainings –

- WORLD RESOURCES INSTITUTE (WRI) - Policy analyst internship funded by WIPRO. Policy analysis, In Food and land use coalition Project (FOLU)- on sustainable and regenerative agriculture in rainfed areas of India (2022).

- IIT KHARAGPUR – Internship trainee - PCR and cloning of full coding sequence of leishmania donovani (2018)

- CRY CHILD RIGHTS AND YOU - Public relations intern

- TROPICAL MEDICINE- research intern – E. coli and UTI causing microbe.

- EASTERN RAILWAYS - Signaling and Database Management

Certification -

- Introduction to the Biology of Cancer from Johns Hopkins University.

- Advance neurobiology from Peking University.



Tanmai Saxena

Graduation: B.Sc. Biochemistry hons., Delhi university.

Research Interests: Molecular Biology, Recombinant DNA technology, Genetics, Genomics, Transcriptomics, Epigenomics, Metagenomics, Computational Biology, Synthetic biology, carbon sequestration via phycology.

Work experience/ projects/ trainings –

- Minor project at TERI GRAM, 'exploring the soil sealing potential of microalgae in saline and marine conditions'

- Training at Dept. of Biotechnology, Delhi University South Campus on – Basic Molecular Biology Techniques

- Fluorescent Microscopy

- Basics of R-programming, Udemy

- Several photography projects

Cofounded – The Ruhaniyat Project – an open mic project oriented towards preserving the cultural identity of India through stories, poetry and music

Occulis – filmmaking society of Deshbandhu college, Delhi university.

- Marketing project at locale pal (startup oriented towards affecting tourism and travel at a local scale).



Tanishka Uttam

Research Interests – Plant metabolic and development, in-Silico drug designing and genomic

Work experience/ projects/ trainings –

- NIPGR (National Institute of Plant Genomic Research, New Delhi, India
- . Project –Bioinformatics
- 3. Trainee –Medical Nanotechnology from IIT Madras
- 4. (Intern), Dayalbagh Educational Institute
- 5. Course Coursera – Algae biotechnology
- 6. Drug Intern at rapture biotechnology



Mamta Negi

Graduation: B.Sc. (Prog.) Life Science, Gargi College, University of Delhi

Research Interests: Bioinformatics, IPR, Computer Aided Drug Designing, Drug Discovery, Proteomics, Nanobiotechnology, Protein Structure and Modelling, Industrial Biotechnology, Food Biotechnology, Immunology.

Work experience/ projects/ trainings:

- 1 month internship for lab techniques and in silico protein study in Structural and Molecular Biology Laboratory, TERI under Dr. Chaitanya Madhurantakam. (2022)
- Attended one-day workshop on Bridging Course for Working in Bioinformatics Laboratories organized by Botany Department, Sri Aurobindo College. (2022)
- Attended online workshop on Bioinformatics organized by Zoology Department, Gargi College. (2020)
- Attended online course on Multidisciplinary facets of science organized by Gargi College, Botany Department, (2020)



Devshree Singh

Graduation: Deen Dayal upadhyaya college, University of Delhi.

Research Interests – Crop improvement through genetic engineering, food fortification, CRISPR-Cas9 system, recombinant DNA technology, cancer biology, stem cell and developmental biology, and genetics and genomics.

Work experience/ projects/ trainings –

Worked as a trainee at the National Institute of Plant Genome Research in Dr. Aashish Ranjan's lab on the topic of Cloning and expression analysis of pif transcription factor in regulating leaf thickness in Arabidopsis and quantifying Oryza Sativa leaf sections for analyzing the change in leaf thickness. Organized an international webinar on the topic "Decoding Complexity of Cancer" at TERI School of Advanced Studies.



Ishika Katiyar

Graduation- B. Sc. (Hons.) Botany, Bhaskaracharya college of Applied Sciences, University of Delhi.

Research Interests – Drug discovery, designing and molecular docking, proteomics, IPR, Bioinformatics, Microbial communities and their interactions, Pharmaceuticals and Health Care, Industrial Biotechnology, Immunology.

Work experience/ projects/ trainings –

1. Training on “Basic Techniques in Biotechnology,” under the supervision of Dr. Vishal Chandra in the Institute of Biosciences and Biotechnology, Chhatrapati Shahu Ji Maharaj University, Kanpur.
2. Online Summer Research Project on “In- silico Protein Docking and Drug Designing” organized by Gargi college, University of Delhi.
3. Internship on “Biotechnology techniques in Structural and Molecular Biology Lab” and in- silico protein study under the supervision of Dr. Chaithanya Madhurantakam at TERI School of Advanced Studies, New Delhi.
4. IP Awareness Training program under National Intellectual Property Awareness Mission.
5. Workshop on "Bioinformatics- Sequence analysis to model building" organized by Phytomics: The Botanical society of Bhaskaracharya College of Applied Sciences (University of Delhi).
6. Bridging Course for Working in Bioinformatics Laboratories – A one day certification course and hands-on session on understanding the basics of UBUNTU, organized by Department of Botany, Sri Aurobindo College, University of Delhi.



KEY RECRUITERS

The TERI SAS facilitates placement of students for major projects and placements through placement cell in relevant industry and suitable organizations. The students undertake intensive internship with municipal corporations, parastatals and urban development consulting organizations.\

Some of the key recruiters have been

- AIIMS
- Cactus Communication
- Career 360
- CDRJ, Lucknow
- Centre for Cellular & Molecular Biology
- Department of Plant Molecular Biology, Delhi University
- Department of Genetics, Delhi University, South Campus
- Edunguru, Sahara Office, Edun Guru Ennovation Life Sciences
- IARI
- ICGEB, New Delhi
- Indian institute of Chemical Technology
- Industrial Info Research Pvt. Ltd., Gurgaon
- Innodata
- International Center for Genetic Engineering & Biotechnology

- IQVIA
- JNU
- KEN Research Pvt. Ltd.
- Lakshmikumaran & Sridharan Attorneys, New Delhi
- Lanllahiry Salhotra / Lexorbis
- NIPGR
- NIPGR
- NRCPB
- Panacca Biotech India
- Project Guru
- QuintilesIMS
- Resource and Information System for Developing Countries (RIS)
- TERI
- YJ Trivedi & Co. - Law Firm / Krishna & Saurastri Associates

PLACEMENT PROCEDURE

PLACEMENT PROCESS AND GUIDELINES FOR RECRUITERS

The campus recruitment activity is conducted to serve dual purposes, placement of the students for their final project which is undertaken in the fourth semester, and the formal job recruitment on completion of the programme.



Our placement process consists of two phases

MAJOR PROJECT	
Recruitment Period	Availability of Students
October – December 2022	February – June 2023

JOB PLACEMENT	
Recruitment Period	Availability of Students
October 2021 – June 2022	June 2023 onwards

Placement Cell

Student Placement Coordinators:

Mehr Munjal
mehr.munjal@terisas.ac.in

Diyotima Karfa
diyotima.karfa@terisas.ac.in

Faculty Placement Coordinator:

Dr. Shashi Bhushan Tripathi
Professor
Department of Biotechnology
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