

TERI SCHOOL OF ADVANCED STUDIES PLACEMENT BROCHURE

2023

M.Sc. Water Science and Governance and Mtech. Water Resource Engineering and Management



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

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 and robust computer facilities, 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 wind turbines.

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. Nagui 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

by Nominee 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 Dev 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 As<mark>sociate Professor, TE</mark>RI SAS

Secretary

<mark>Mr. Kamal Sha</mark>rma 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 promotion of desciplinary enables the 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 is to createing a cadre of water professional 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 eccompasses 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 graduationg 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 Resouirces

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, Standford 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 the 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
- •Zeta Potential Analyzer
- Refrigerators
- Microscopes
- Laminar Flows
- •Power Pack/Power supply •Gene Pulser X Cell
- BOD Incubator
- •Deep freezers -20°C

- Centrifuges
- Incubator Shakers
- Thermal cyclers
- •EVOX-XL Microscope
- Nanodrop Spectrophotometer
 Ice Franking Machine
- •HB-1000 Hybridization Oven
- •Stereo Zoom Microscope

- Spectrophotometer
- •SE 600 Ruby complete, 2D, Vertical Gel unit
- •2D Gel Electo power supply, EPS 601, GE
- •Gel Doc system XR
- •Growth Chamber GC 100
- •Electronic Balances
- •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. Water Science and Governance (WSG) MTech. Water Resources Engineering and Management (WREM)

Programme Outline

M.Sc. Water Science and Governance (WSG)

The course on M.Sc. Water Science and Governance (WSG) is an interdisciplinary program emphasizing on the aspects of water management in today's era. The main focus is on water management's social, economic, scientific, legal and policy aspects. The objective of the program is to develop a comprehensive understanding of problems associated with water management and its use as a resource. The program is structured to utilize in-depth courses in areas of water and wastewater treatment (in domestic as well as industrial sector), water audit, watershed management, hydrology (including ground water hydrology), gender and water, etc. It equips aspiring water professionals with skills to tackle the current problems and come up with sustainable solutions.

DURATION: 2 Years

First Year: Focus on building a strong technical base for water resources & technologies, water conservation, policies & regulatory framework, project management and software.

Second Year: Hands on learning through minor and major projects

Major Project: 16 - 20 Weeks

Minor Project: 6-8 weeks

MINOR AND MAJOR PROJECT

The students are required to take up minor and major project work in the third and fourth semesters respectively. These projects are research driven and provide a multi-dimensional learning approach for students, which are guided by real-life challenges in the water sector. These projects include industry training or consultancy or in-house research on any water relevant problem through supervised self-learning approach. Students shall focus on specific thematic areas, interpret information using concepts, work on tasks assigned by the supervisor and work on contemporary matters of the water sector in depth, including groundwater management, water pollution, wetlands, wastewater and sewage treatment, innovations in agriculture, water reuse, water efficiency, water audit & management, watershed practices, river basin management, and policy, guidelines & regulations. While working on minor and major projects, students are able to implement their classroom learnings and prepare themselves to take up water resource management projects in future and link them with sustainable development.

Pedagogical Tools

The pedagogical tools consist of lectures, case studies, tutorials, laboratories, field visits, and industry exposure. Regular lectures are supplemented by regular interactions with experts from industry, academia and policymakers.

Programme Outline

MTech. Water Resources Engineering and Management (WREM)

The AICTE approved MTech. Water Resources Engineering and Management (WREM) offered by the Department of Regional Water Studies integrates engineering and technological concepts with socio-economic principles. The courses that are taught as part of the program address the technical, social, economic, legal, and political dimensions of water. Interdisciplinary in its scope and objectives, the program prepares students for a rewarding and challenging career in water resources management. The students not only gain classroom-based knowledge but also engage with industries through multiple site visits, minor project and major project along with special or guest lectures from industry leaders, academics and policymakers. Through specialized in-depth courses, laboratories, and software tools in areas such as geoinformatics, modelling, water audit, water policy, water use efficiency etc., the program enables the students with state-of-art skills and practices in the domain of Integrated Water Resources Management.

DURATION: 2 YEARS

First Year: Focus on building a strong technical base in Engineering for water/waste water treatment & technologies, Surface & Ground Water, conservation, policies & regulatory framework, project management and various software.

Second Year: Hands on learning through minor and major projects

Major Project: 16 - 20 Weeks

Minor Project: 6-8 weeks

MINOR AND MAJOR PROJECT

After the completion of the first academic year, students are required to undergo project work in the 3rd and 4th semesters. The project work offers thorough problem-based learning approach, guided by realistic and challenging industry/field-level/literature review requirements – surface and ground water assessment and management, water and waste water treatment and management, water modeling and prediction (quality & quantity), hazard, vulnerability & risk mapping of floods and droughts, water related disaster management and so on. Prospective employers are invited to hire the students for major projects and assess them for a potential long-term engagement.

PEDAGOGICAL TOOLS

The pedagogical tools employed comprise of classroom lectures, case studies, tutorials, laboratories, field visits, and industry exposure. The regular lectures are supplemented by interactions with experts from industry, academia and policymakers.

Course Details

M.Sc. (Water Science and Governance)

Semester I	
Course Title	Туре
Hydraulics	Core
Water planning and Management	Core
Gender, rights and equity perspective for sustainable water management	Core
Water resources - Institutions and governance	Core
Applied hydrology and meteorology	Core
Water Quality monitoring methods and analysis	Core
Introduction to Geoinformatics	Core
Environmental statistics	
Semester II	
Course Title	Туре
Field trip on Water Management Practices	Core
Water supply and sanitation	Core
Integrated watershed and river basin management	Core
Water audit and demand management	Core
Irrigation water and drainage management	Core
Aquatic eco-system management	Core
Economic and financial evaluation of water infrastructure	Core
Qualitative research methods and technical writing	Core
Semester III	
Course Title	Туре
Water security and conflict management	Core
Minor Project in Water Science and Governance	Core
Water law	Core
Groundwater hydrology and management	Elective
Industrial pollution control	Elective
Social, economic and health dimensions of water, sanitation and hygiene	Elective
Integrated impact assessment	Elective
Semester IV	
Course Title	Туре
Major Project in Water Science and Governance	Core

Course Details

MTech. (Water Resources Engineering and Management)

Semester I	
Course Title	Туре
Advanced Hydraulics	Core
Water planning and Management	Core
Gender, rights and equity perspective for sustainable water management	Core
Water resources - Institutions and governance	Core
Applied hydrology and meteorology	Core
Water Quality monitoring methods and analysis	Core
Introduction to Geoinformatics	Core
Stochastic Modelling	
Semester II	
Course Title	Туре
Field trip on Water Management Practices	Core
Design of Water Supply and Sanitation System	Core
Optimization Techniques for Water Management	Core
Irrigation Water and Drainage Management	Core
Applied Geo-informatics for Water Resources	Core
Water Quality Modelling and Application	Core
Economic and financial evaluation of water infrastructure	Core
Qualitative research methods and technical writing	Core
Semester III	
Course Title	Туре
Water security and conflict management	Core
Minor Project in Water Science and Governance	Core
Water law	Core
Groundwater hydrology and management	Elective
Industrial pollution control	Elective
Social, economic and health dimensions of water, sanitation and hygiene	Elective
Geocomputation	Elective
Integrated impact assessment	Elective
Semester IV	
Course Title	Туре
Major Project in Water Science and Governance	Core

FACULTY PROFILE



PROF. ARUN KANSAL

Vice Chancellor & Professor Department of Sustainable Engineering

Dr. Prateek Sharma has more than 22 years of research/teaching experience. He received his PhD. degree in Environmental Engineering from Indian Institute of Technology, Delhi. He has M.E. in Hydraulics and flood control and B.E. in Civil Engineering from Delhi College of Engineering, Delhi. Dr. Prateek's general research interests focus on Modeling, Statistical Applications Environmental Systems in Environmental and Water Resources Engineering, and Environmental Risk Assessment. He has been regularly contributing to high impact academic journals. Dr. Prateek has also authored two books (international editions) in the area of vehicular pollution modeling and stochastic modeling and one monograph. Presently, he is writing two books titled Environmental Data Analysis, and Environmental Modeling. He is a member of several professional societies. Dr. Prateek has been admitted as a Fellow of Wessex Institute of Great Britain in 2004, in recognition of outstanding scholarly work. Prior to joining TERI SAS, Dr. Prateek worked for the School of Environment Management, GGS Indraprastha University for eight years.



Dr. Fawzia Tarannum

Assistant Professor

Coca-Cola Department of Regional Water Studies

Dr. Fawzia Tarannum is an interdisciplinary water professional with 22 years of experience in project management, teaching, research, and capacity building. Dr. Fawzia received her Ph.D. in Water Science and Governance from TERI SAS and she earned her undergraduate degree in Electrical Engineer. Dr. Fawzia's research interests include gender equity, participatory water governance and water conservation. Having received the Climate Reality Leadership Corps Training, Dr. Fawzia is a passionate Climate Reality Leader and has conducted awareness and capacity building programs on Water Conservation, Climate Change, Renewable Energy and Gender Equality, among others.



Dr. Prateek Sharma

Vice Chancellor & Professor Department of Sustainable Engineering

Dr. Prateek Sharma has more than 22 years of research/teaching experience. He received his PhD. degree in Environmental Engineering from Indian Institute of Technology, Delhi. He has M.E. in Hydraulics and flood control and B.E. in Civil Engineering from Delhi College of Engineering, Delhi. Dr. Prateek's general research interests focus on Modeling, Statistical Environmental Systems Applications in Environmental and Water Resources Engineering, and Environmental Risk Assessment. He has been regularly contributing to high impact academic journals. Dr. Prateek has also authored two books (international editions) in the area of vehicular pollution modeling and stochastic modeling and one monograph. Presently, he is writing two books titled Environmental Data Analysis, and Environmental Modeling. He is a member of several professional societies. Dr. Prateek has been admitted as a Fellow of Wessex Institute of Great Britain in 2004, in recognition of outstanding scholarly work. Prior to joining TERI SAS, Dr. Prateek worked for the School of Environment Management, GGS Indraprastha University for eight years.



Dr. Ranjana Ray Chaudhari

Assistant Professor

Coca-Cola Department of Regional Water Studies

Dr. Ranjana Ray Chaudhuri is a Civil Engineer and an Environmental Engineer and has over 25 years of experience in industry and academics. She has worked in the field of academics and infrastructure involving feasibility studies, design, evaluation and tender preparation. As a faculty member, Dr. Ranjana teaches courses in Hydrological Modelling, Hydraulic and Water Resource Modelling and Simulation, Integrated Resource Management, Watershed Hydrology and Management, Watershed Modelling and Rainfall Modelling among others. Her areas of interest include water resource management, watershed hydrology, and analysis of hydrologic systems including predictions.



Dr. Sherly M.A.

Assistant Professor

Coca-Cola Department of Regional Water Studies

Dr. Sherly M.A. has more than 10 years of work experience that includes teaching, industry and research. She received her Ph.D. on 'Urban Flood Risk Mapping of a Coastal Megacity – An Application to Mumbai' from IITB-Monash Research Academy (A joint Ph.D. program between Indian Institute of Technology Bombay and Monash University, Australia) based in Mumbai. Dr. Sherly completed her MTech in Hydraulics and Water Resources Engineering from the Department of Civil Engineering, Indian Institute of Technology Madras. Her interests include urban flood risk mapping, design rainfall analysis, flood modelling and hazard mapping, hydrologic & hydraulic modelling, disaster vulnerability assessment & mapping, and optimization in water resources.

Dr. Sudipta Chatterjee

HOD and Associate Professor

Coca-Cola Department of Regional Water Studies

Dr. Sudipta Chatterjee specializes in forests and biodiversity conservation. He has more than 20 years of experience in this field and has done his PhD in Botany and M.Phil. in Ecology. Recipient of the Whitley Associate Award, UK, Dr. Sudipta worked as Head the Communities and Biodiversity and Forests and Carbon Division of Wildlife Trust of India. He worked as Biodiversity and Protected Area management specialist at Sikkim Biodiversity Conservation and Forest Management Project, Integrated Development Division, Louis and Berger Group, Inc., and served as Team Member Biodiversity in the Technical Facilitation Organization for the Sustainable Land and Ecosystem Management, GEF Project at the ICFRE, Govt of India. Dr. Sudipta has also worked as Head of Forests and Biodiversity Divisions at Winrock Int. India and WWF – India.



Dr. Sukanya Das

Associate Professor

Department of Policy and Management Studies

Dr. Sukanya Das is an environmental economist with an interest in environmental valuation and policy. Prior to joining TERI SAS, she was a faculty at Madras School of Economics for more than seven years after completing her Ph.D. from Jadavpur University. Dr. Sukanya has an expertise in handling research projects in the area of Environmental and Resource Economics, Water Economics and Health Economics. She teaches courses in Environmental and Resource Economics, Environmental Valuation, Economics of Health and Environment. Dr. Sukanya's current research interests include Environmental Valuation particularly in the area of Water and Wastewater Management, Ecosystem Services. Agricultural Economics, Water Economics, Urbanization and Environment.





Dr. Vinay Shankar Prasad Sinha Professor

Department of Natural and Applied Sciences Dr. Vinay Shankar Prasad Sinha received his Ph.D. in Urban and Regional Planning domain from Banasthali University, Rajasthan. He did his MTech in Remote Sensing and Postgraduation in Geography. Dr Sinha has over 15 years of research, teaching and consultancy experience in the areas of Geoinformatics, Water Resource Planning, Groundwater Resource Modeling and Natural Resource Assessment and Management. Dr. Sinha has extensively traveled most of the states in India and is well versed with geology, geomorphology and physiography including socio-economic configuration. At TERI SAS, he is teaching courses related to Geoinformatics, Spatial Modeling and Geoinformatics for Water Resources and Strengthening Application of Remote Sensing & Spatial Modeling in various disciplines. He is also Adjunct Research at TERI and is advising activities related to applications of Geospatial Modelling, Water Resources and allied technologies. Currently, Dr. Sinha is supervising doctoral research related to assessing influence of climate change on water availability and distribution on vulnerable communities in Central Himalaya; water accounting framework for Eastern Himalaya in context to climate change; agricultural land dynamics in SAARC Nations: relevant to food security in climate change scenarios and storm surge assessments of warm climate scenario over West Bengal. His research projects are mostly formulated over the Himalayan region and link with fragile ecosystem of Himalayan community and policy formulation and mitigation planning due to extreme weather conditions.



GUEST FACULTY

Dr. Mansee Bal Bhargava

Guest Faculty

Dr. Mansee is involved with CU, Rajasthan; NID, Gandhinagar; TISS, Hyderabad; TERI-SAS, New Delhi; CEPT University, Ahmedabad; SAL-SOA GTU, Ahmedabad. She is also an affiliated faculty at The Ostrom Workshop Indiana University; and IHSErasmus University Rotterdam. In the past, Dr. Mansee's involvements were with various universities, organizations and schools from time to time such as ASAP Amity University Chhattisgarh; IIT-Bhilai; IAPNU Nirma University Ahmedabad, IPSA Saurashtra University Rajkot; Anant University; and Thaltej-Ghatlodia Municipal Schools, Ahmedabad. The learning and sharing methods are usually of going back and forth between classrooms and fields. Besides degree-based courses and supervisions, she enjoys conducting specially designed courses, training, workshops, seminars on diverse topics that are unconventional yet required in the society especially focused on a pedagogy towards building active and sensitive alias responsible citizenship.

Dr. Vishal Narain

Guest Faculty

Dr. Vishal Narain holds a Ph.D. from Wageningen University, the Netherlands. His academic interests are in the inter-disciplinary analyses of Public Policy Processes and Institutions; Water Governance; Gender Rights and Equity analyses in Water Management; Management of Common Property Resources; Peri Urban Issues and Vulnerability and Adaptation to Environmental Change. Dr. Narnia's research on these subjects is published in several high-ranking journals like Land Use Policy, Geoforum, Climate Policy, Water International and Society and Natural Resources. He is particularly interested in the relationship between technology and institutions in water management and he explores these relationships using ethnographic and participatory research methods. Dr. Narain has been consultant to several international and regional organizations such as the FAO of the United Nations, Bangkok; ICIMOD, International Center for Integrated Mountain Development, Kathmandu; the Asia Foundation, New Delhi; IWMI, International Water Management Institute, Colombo; the STEPS Center, University of Sussex, UK; and SaciWATERs, the South Asian Consortium for Inter-Disciplinary Water Resources Studies, Secunderabad, India.

Student's Profiles

M.Sc Water Science & Governance & M.Tech Water Resources Engineering & Management



Aditya Nath

Academic Background: B. E. (Civil Engineering)

College: Jaypee University of Information Technology

Minor Project Title: Hydrological modelling of Ramganga Basin using MIKE SHE and ARCMAP stimulation

Minor Project Organization: NMCG (National Mission for Clean Ganga) **Areas of Interest:** River rejuvenation and modelling, Urban-water distribution network, Sewage management and treatment, GIS modelling and mapping, ESG, Hydrological modelling, Climate assessment and management, Urban floods risk management.

Major Project Organization: ICICI FOUNDATION Experience:

• Internship at NMCG as a Research Assistant working on the project of river rejuvenation and the prepared a report on the project of a stp plant of 38 mld constructed in the district of Chandauli, Pt Deen Dayal Upadhaya.

• Training at IIT Roorkee for the software of MIKE including the DAM BREAK 2D model associated with it.

• Internship at Intershala for STAAD PRO analysing the construction of green buildings and corridors mainly associated with BLUE GREEN INFRASTRUCTURE.



Academic Background: B.E. (Civil Engineering) College: Shri Ram Swaroop memorial University, Lucknow Minor Project Title: Geo-spatial analysis of urban flooding in municipal corporation gurugram Minor Project Organization: GuruJal Society Areas of Interest: pond rejuvenation, water logging, groundwater study, water resource management and study GIS, water scarcity and urban flooding. Major Project Title:

Adeel Ahmed Siddiqui

Major Project Organization:

	Academic Background: B. E. (Civil Engineering)
	College: Institute of Technology and Management Universe, Vadodara.
and	Minor Project Title: Study on Seawater Intrusion in the coastal district of Gujarat:
	Case study of Junagadh
	Minor Project Organization: TERI SAS
	Areas of Interest: Integrated water resource management, urban hydrology, Water
	Infrastructure, GIS.
	Major Project Organization: RMS
Bharg Modi	Experience:
	Project Intern at TERI (June, 2022 - August, 2022)
	Research Intern at National Institute of Hydrology – Roorkee (August, 2022 –

- September 2022)
- Project Intern at Eco Development Research Cell (March, 2022 May, 2022)
- Trainee Intern at Sterling Construction (August, 2018 October, 2018)



Academic Background: B.Sc (Life Sciences) College: Shivaji College, Delhi University Minor Project Title: Citizen Science in Water Resources Minor Project Organization: TERI SAS Areas of Interest: Climate Change and Mitigation, Urban hydrology, Water Infrastructure, Environmental Sociology, Research and Analytics, Sustainable Practices.

Bhumika Khatreja

Major Project Title: Major Project Organization: TTC



Gaurav Fouzdar

Academic Background: B. E. (Civil Engineering) College:- Raja Balwant Singh engineering technical campus, Bichpuri, Agra (AKTU) Minor Project Title:- Assessing Sediment Delivery Patterns in Tawi Catchment

Minor Project Title:- Assessing Sediment Delivery Patterns in Tawi Catchment using InVest model.

Minor Project Organisation:- IIT Jammu

Area of Interest:- Hydrological modelling, Geocomputation, GIS and Remote sensing , Integrated watershed management, sedimentology, Atmospheric modelling, Extreme weather analysis, groundwater quality and quantity assessment technique.



Kalpana Patel

Academic Background: Bachelors of Arts in Social Sciences College: Tata Institute of Social Sciences Minor Project Title: Transformation in Urban Hydrology in the light of climate change: With instances from Mumbai Minor Project Organization: National Institute of Hydrology (NIH), Roorkee

Areas of Interest: Climate Change, Climate Finance, International Negotiations, Governance & Policy, Hydrology

Experience:

- World Resources Institute Project Intern | 5 months
- National Institute of Hydrology Internship | 5 months
- Wipro Foundation Sustainability Intern | 2 months
- Nestle India Internship | 3 months
- White Hat Jr. Team lead Content | 18 months
- Rang Abhiyan Project Manager | 24 months

Membership:

- National Youth Coordinator for WICCI- Water Resources Council.
- SDG Coordinator for UN Sustainable Development Solution Network (SDSN) Youth.
- Editor for Vasundhara magazine of TERI-SAS.



Karm Jadeja

Academic Background: B.Sc (Geology)

College: The Maharaja Sayajirao University of Baroda

Minor Project Title: Groundwater quality assessment of Nakhatrana Block, of Kachchh Dist. Gujarat, under Atal Bhujal Yojna (ABhY)

Minor Project Organisation: Arid Communities and Technologies (ACT) **Areas of Interest:** Spring Management, PGWM, community-basedwater resource management, GIS mapping and modeling, Data and analytics etc. **Experiences:**

- GIS analyst, freelancing with more than 10 different companies across Kachchh as well as Gujarat since past 2 years.
- Developed and Provided the maps (location, drainage, watershed, geological, geomorphological, land use etc) for the entire Bhuj block (includes more than 120 villages) under Atal Bhujal Yojna.
- Worked as a field lead and supervisor and conducted monitoring and quality assessment for 50 villages of nakhatrana block of Kachchh for ACT, under the Atal Bhujal Yojna
- Developing the course on participatory groundwater management and community based natural resource management with WIN Foundation for the purpose of easy groundwater science dissemination around the community.
- Conducted capacity building programs focusing on groundwater management for the community.
- Had completed the training on water auditing with the CSE through distance learning.



Mohammed Imroz

SQL, R programming. **Experience:**

using SPHY model

• Project Intern at The Energy Resources Institute, New Delhi

Academic Background: B. E. (Mechanical Engineering)

University- Dr A.P.J Abdul Kalam Technical University, Lucknow



Sayyad Sahil Ahmed

Academic Background: B. E. (Civil Engineering)

College: Noida Institute of Engineering and technology, Greater Noida **Minor Project Title:** Rainfall forecasting using neural network model for Ramganga basin

Minor Project Title- Water Availability Analysis for the sub-basin of Chenab River

Area of Interest- Climate Change, Groundwater Modeling, Flood Modeling, Snow and Glacier Analysis, ESG, Sustainability, Data Analysis, Hydrological Modeling,

Minor Project Organization- The Energy and Resources Institute, IHC India.

Minor Project Organization: TERI SAS

Areas of Interest: Hydrological modeling, flood modeling, water distribution, Data analysis, Machine learning, Geospatial data analysis, Python programming for geospatial-hydrological analysis, Hydrology, Statistical modeling, Climate change, Weather forecasting, Flood risk management, Extreme weather analysis, Urban planning, Land cover classification, GIS.

Experience:

- Climate B Ventures Data Analyst Intern | 4 months
- Risk Management Solutions (RMS) Modelling Analyst Intern | 2months
- Risk Management Solutions (RMS) GIS Engineer | 24 months



Yukti Sharma

Academic Background: B. Tech (Environmental Engineering) **College:** Delhi Technological University, Delhi

Minor Project Title: Vulnerability mapping of Ground water in Delhi with suggestive capacity building techniques for Groundwater management

Minor Project Organization: TERI SAS

Areas of Interest: Policies as well as Technology Interventions, Environment Impact Assessment, Audit, Planning, Environmental Research, Consultancy, Geoinformatics, Water quality analysis, Groundwater management, Climate risk and Sustainability. **Major Project Title:**

Minor Project Organization:

Experience:

• Maritime Research Center, Pune based think tank, fellowship for creating Fresh water management framework and Underwater Domain awareness, involved in dealing with UNESCO cluster office related matters.

• Delhi Pollution Control Committee, in the Research Development and Planning Cell. Worked in coordination with all other departments related to compliances and research. Funds utilization and Environment Damage Compensation.

• Perfact group of Solutions, An environment based consultancy, dealt with Environment Impact assessment, PARIVESH Portal, and other ministry meetings related to Environment Clearances.

PLACEMENT PROCEDURE

The campus recruitment activity for M.Sc. Water Science and Governance (WSG) MTech. Water Resources Engineering and Management (WREM) is conducted to serve a dual purpose:

- Major Project Placement fourth semester of the programme
- Formal job recruitment on completion of the programme.

Major Project and Job Placement

Recruitment Period Round-1: October – December 2022

Availability of Students for Major Project: February–June 2023

Recruitment Period Round-2: January-June 2023

Availability of Students for Placements | June 2023 onwards

We welcome organizations/corporates/institutions/others to visit our campus for interviewing and selecting the students for fourth semester masters' thesis project and final placements. You may interact with our students through telephone, video conferencing, or in person.

Interested organizations may contact the Placement Cell, the details of which are mentioned at the back of the brochure.

Placement Cell

Student Placement Coordinators:

Kalpana Patel kalpana.patel@terisas.ac.in

Gaurav Fouzdar gaurav.fouzdar@terisas.ac.in

For Further Information, Contact:

Ms Sonika Goyal Placement Manager, TERI School of Advanced Studies 10, Institutional Area, Vasant Kunj New Delhi-110070, India Email: sonika.goyal@terisas.ac.in Website: www.terisas.ac.in Phone: 011-71800222



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