

MSc (Geoinformatics)

Sponsored Candidates

Candidates working in the Industry/Government are encouraged to apply for the full-time M.Sc. programmes. Upto five seats can be reserved in each programme for such candidates. All those who satisfy the minimum qualifications, mentioned in the above para may be admitted to the programme on the basis of an interview. These candidates are required to submit, at the time of interview, a sponsorship certificate from their employer on a proper letterhead, stating that for the period of his/her study at the University, the candidate will be treated as on duty with usual salary and allowances and that he/she will be fully relieved for the period of study for pursuing his/her studies. Sponsored candidate's application will be accepted only from those on the pay rolls of & sponsored by a registered company. Such applications would need to be accompanied by the audited balance sheet of the company and last year's income tax return of the applicant indicating the salary received from the company

Pedagogical Tools

The pedagogical tools comprise not just classroom lectures but also case studies, field visits, term papers, assignments and tutorials, guest lectures by practitioners and experts, seminars, and discussion forums. Group and individual projects involves analysis of diverse spatio-temporal datasets to demonstrate solution to specific issues of environment and social sciences.

Placement

The students who complete MSc Geoinformatics possess the requisite confidence and skills to work as GIS engineers, geo-database managers, and remote sensing specialists in both public and private organizations. It will also be a structured route to doctoral research work. The Placement Cell of TERI SAS is committed to aid placement of its students. Some of the organizations where our past students are currently working are given below:

- Indian Space Research Organisation (ISRO)/ Regional Remote Sensing Centre (RRSC)
- ESRI India (NIIT GIS Ltd.)
- RMSI
- WWF-India
- Development Alternatives
- Yale School of Environment and Forestry
- Indian Agricultural Statistics Research Institute (IASRI)
- Tata Consultancy Services
- Pitney Bowes India
- Digital Globe

Department of Natural and Applied Sciences

Quality of life depends on the quality and quantity of natural resources available for use to human race. 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 disciplinary academic background 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.

About TERI School of Advanced Studies

Academic programmes at the TERI SAS are focused around the challenges of providing the advanced studies rising global population with a limited and degraded natural resource base. In moving towards sustainability, the implicit understanding is that there is no panacea or straight road, with recognized and established methodologies, tools or specializations leading to such development.

The solutions therefore do not lie in a specific subject discipline, but must be appropriate and relevant to the context or the practical problem being addressed. Developing such an understanding among its students is best achieved through exposure to a variety of subjects, tools, and methodologies offered in interdisciplinary mode. This has been the guiding philosophy behind the programmes offered by the TERI SAS and is practised by building a theoretical understanding in courses covering a variety of traditional disciplines, such as ecology, natural and social sciences, governance, policy, law, and engineering.

Over a period of two years, students converge upon a few areas of focus based upon their interest, having been exposed to a new way of thinking that looks at problems not from the lens of a subject specialist, but from the perspective of one who recognizes the complex linkages between man and his environment.

Apart from doctoral research, the TERI SAS offers M.Sc. degree programmes in Environmental Studies and Resource Management, Environmental and Resource Economics, Geoinformatics, Water Science and Governance, Climate Science and Policy, and Biotechnology; MBA in Sustainability Management; and M.Tech. programmes in Renewable Energy Engineering and Management, Water Resources Engineering and Management and Urban Development Management.

The institute offers two M.A. programmes, one in Public Policy and Sustainable Development, and the other in Sustainable Development Practice. TERI SAS is one of a select group of 22 institutions chosen worldwide by the MacArthur Foundation, USA, to run the Sustainable Development Practice programme. The institute uses modern pedagogical tools, richly supplemented by field visits, live industry projects, and hands-on applications. It provides the very best in equipment and instruments, which includes state-of-the-art computer facilities, well-equipped laboratories, video-conferencing facilities, and access to South Asia's most comprehensive library on energy and environment.

TERI SAS has established excellent partnerships and collaborative arrangements with a number of institutions overseas, including Yale University, USA; The Freie University of Germany; Utrecht University, The Netherlands; North Carolina State University, USA; and University of Technology, Australia.



Deemed to be University
Under Section 3 of the UGC Act
Accredited with
'A' grade by NAAC

MSc (Geoinformatics)



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Feb 2023 (50)

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Of late there has been a growing realization that India should emerge as an economy driven by knowledge. Given the rapid progress that intellectual enterprises are making worldwide, higher education must benefit from a continuous accretion of knowledge through research. This is what TERI SAS is attempting to do through all its programmes, for the benefit of not only Indian citizens but people from other countries as well who would pass through the portals of this institution. This University offers education supported by rigorous research.

Geoinformatics

The new millennium has brought access to vast, continuous, and well-calibrated stream of spatial data on natural and socio-economic systems dynamics. The availability of data is increasing at exponential rate through technological advances in space-based and field based earth observations. It allows monitoring and management of environmental processes across a wide range of spatial and temporal scales. Full exploitation of the potentialities requires integration of such datasets in the geo-enabled data processing, mining, analysis, assimilation, interpretation, and visualization environment. It has great social and national relevance and can support preparing sustainable development strategies, enabling enterprises to manage business processes efficiently and bring geographical knowledge to citizens.

With time, we need a sound knowledge base in the state of art of Remote Sensing and GIS technology and their applications not just for bringing benefits of information system to country but also help in formulating efficient national development efforts in cross-cutting issues of environment, climate change, infrastructure development, and even in homeland security cooperation. Thus TERI SAS has been offering an M.Sc Geoinformatics since 2008 to enable budding professionals and researchers to address these pressing issues.



Programme Overview

Spatial and non-spatial datasets are crucial for studies on environmental and sustainable development planning. Also, the emerging need of geo-spatial technology has created an unprecedented demand of trained manpower, who can contribute to production and analysis of these datasets. In order to fulfil the need of such trained professionals, the MSc in Geoinformatics offers training in cutting-edge technology, which has the potential of providing consistent and timely information required for natural resource management.

The Programme, offered by the Department of Natural and Applied Sciences, is intended to educate students and professionals about Remote sensing/Geographical information system/Global Navigation Satellite System and spatial modelling techniques. It also offers elective courses that help students in understanding the interdisciplinary applications of this leading technology. Students who complete this programme will possess the confidence and skills to attract a wide range of potential employers in both public and private organizations. This Master's degree provides a structured route to research and development in the area.

Programme Outline

The Programme comprises a set of core courses taught during the first and second semesters. This is followed by a minor project to be completed during the summer through internship. A set of advanced courses and elective courses, taught in the third semester allows students to gain in-depth knowledge in this field and specialize in a theme of interest. In the third semester, student is also required to take up an independent study. It encourages students to conduct independent research to get the feel of real-time research project experience. In the final semester, the student must carry out a semester long research project preferably in a company or organization outside the University to gain exposure to professional experience to real-life situations.



Semester 1

- Principles of Cartography
- Principles of Remote Sensing
- Principles of GIS and GNSS
- Fundamentals of Computers and Programming
- Applied Mathematics
- Communication Skills and Technical Writing

Semester 2

- Photogrammetry
- Environmental Statistics
- Spatial Data Modelling and its applications
- Digital Image Processing and Information Extraction
- Programming in Geoinformatics
- Law and Policy for Maps and Remote Sensing
- Project Management
- Research methodology and thesis writing

Minor Project

As a part of summer internship, students undertake a minor project for 8 weeks with a relevant industry or organization. The minor project is supervised by a professional/researcher in that industry/organization. The project carries credits and is assessed and graded.

Semester 3

Core Courses

- Advances in remote sensing: Thermal, Hyperspectral, Microwave, LIDAR and UAV
- Advances in GIS and current trends

Elective Courses

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| • Geocomputation | • Geoinformatics for Land Resources | • Integrated Impact assessment |
| • Integrated Watershed Management | • Geoinformatics for Water Resources | • Climate Change and Disaster Risk Reduction |
| • Wildlife Conservation and Management | • Geoinformatics for Atmosphere | • Environmental Modelling |
| | • Multivariate data analysis | |
| | • Spatiotemporal data analysis | |

In addition students can choose electives from other disciplines as well.

Semester 4 (Major Project)

In the final semester, students carry out a structured major project (MSc dissertation) in an industry or organization. The major project is carried out under the joint supervision of a professional/researcher in the industry and a faculty member at the TERI SAS. The project carries credits and is assessed and graded.

Eligibility Criteria

A Bachelor's degree in Science/Engineering/B. Arch/ Economics/Mathematics/Statistics/ Geology/Geography.

Selection Procedure

Admission to the M Sc programmes is made on the basis of an online test and interview conducted by the University. Applications are invited from the candidates by advertising the programmes in some leading newspapers every year. The online test one-hour long and consists of one paper with 100 multiple-choice questions.

The questions are divided into three sections:

- Proficiency in English
- Analytical reasoning
- Quantitative ability

There is negative marking for wrong answers. The written exam is followed by an interview.

