

# MASTER GEO-INFORMATION SCIENCE AND EARTH OBSERVATION



**MSC**  
DIPLOMA



**120**  
CREDITS



**SEPTEMBER**  
STARTS



**>25,000**  
REMOTE SENSING ALUMNI

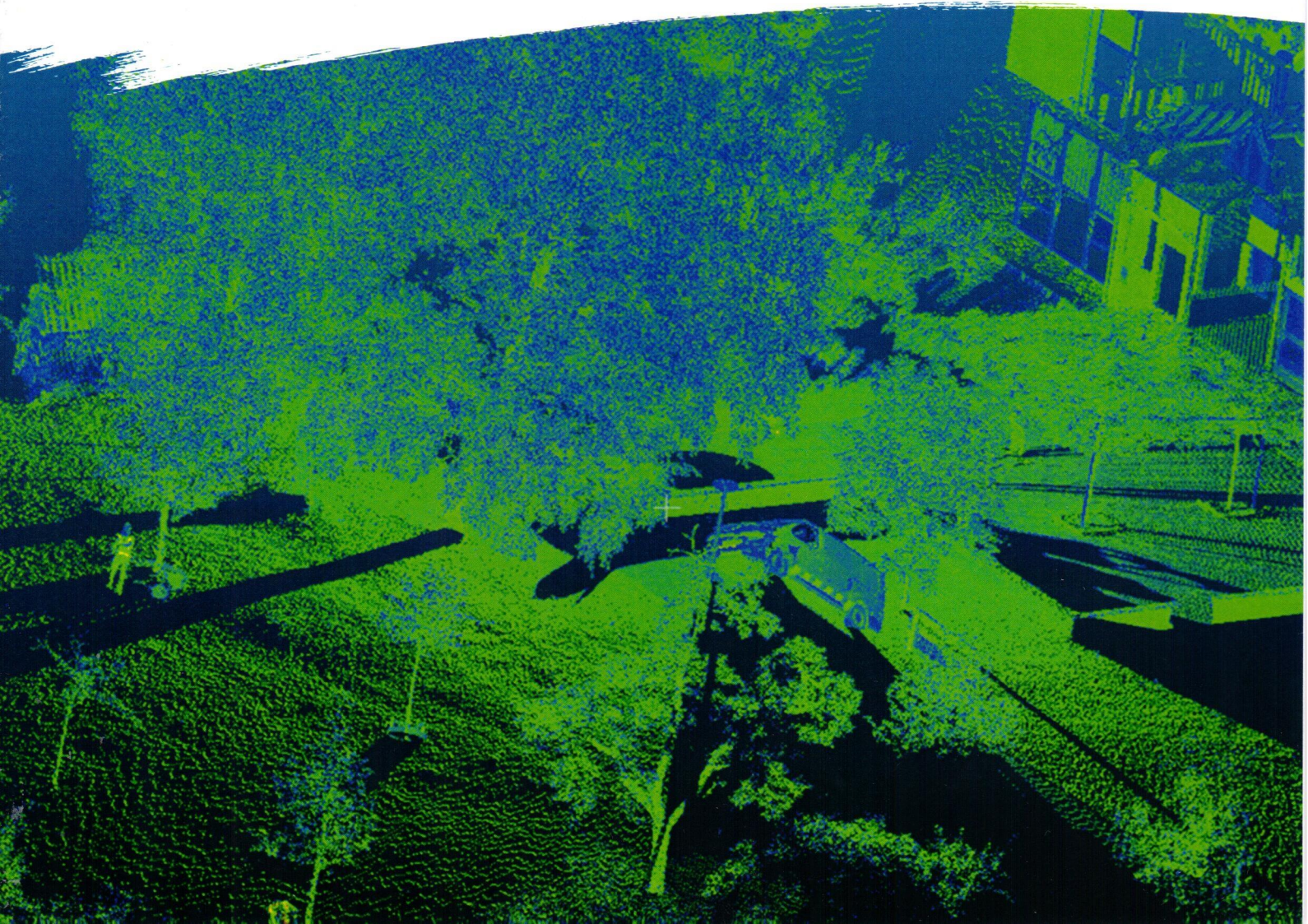


**9<sup>TH</sup>**  
WORLD SHANGHAI SUBJECT  
RANKING ENGINEERING &  
REMOTE SENSING

UNIVERSITY  
OF TWENTE.



ITC



# GEO-INFORMATION SCIENCE AND EARTH OBSERVATION

Contribute to solving some of the world's most pressing challenges - such as climate change, food and water security, land scarcity, and natural disasters - by mastering the acquisition, analysis, and processing of geo-information data.

We live in a geo-enabled society where geographic information, earth observation data are vital. These data are invaluable for decision-making and creating a liveable planet. They are used for monitoring the environment and resources, tracking species occurrences, assessing ecosystem conditions; mapping health risks, land-use patterns and the changes taking place across space and time. Our planet is changing and with that we need to understand how it is changing, where it is changing and the consequences of these changes.

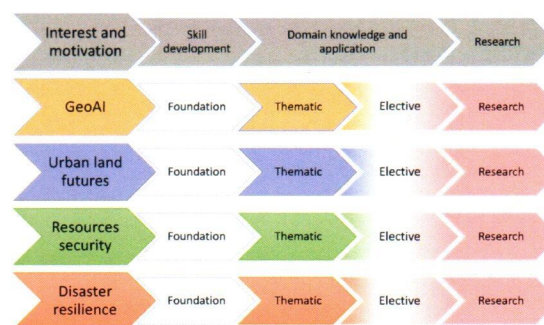
This Master's equips you with the necessary geospatial skills needed to address the global challenges of today, finding solutions through local actions. By leveraging geographic and earth observation information, spatial data science and geospatial technologies you will gain the theoretical knowledge, develop the technical skills, and data competencies to address complex problems and devise innovative, sustainable solutions.

## FOCUS AND PATHWAYS

Our programme is comprised of several parts:

- **essential geospatial skills:** you will develop geospatial skills
- **a thesis research project:** you will apply what you have learned to a project of your choice while also fine-tuning your project management and communication skills
- **electives:** we offer a range of electives that will enable you to further advance your technical skills, broaden your areas of interest and fine-tune your professional competencies
- **themes:** we offer a range of themes so that you can customise your curriculum. Our themes are centered around technologies (Geo-AI), the natural environment (Resource Security), and society (Urban Futures and Hazard Resilience).

[ut.onl/mgeo-structure](https://ut.onl/mgeo-structure)



*Design your own learning pathway, depending on your personal career ambitions.*

### GEO-AI

Develop cutting-edge technology and algorithms using the latest advancements in AI and big data.

### RESOURCE SECURITY

Dive into the fair and sustainable use of our natural environment. This field covers the planning and management of vital resources such as food, water, minerals, and land for energy transitions, food security, and ecosystem services.

### DISASTER RESILIENCE

Build a safer and more resilient world by developing the skills to help communities prepare for, respond to, and recover from disasters.

### URBAN FUTURES

Shape the cities of tomorrow. You'll work on creating safe, healthy, liveable, resilient, and just urban spaces, contributing to the transition towards sustainable urban futures.

### SPATIAL DATA SCIENCE

Perhaps you are interested in following courses that intersect these four main themes. Contact us and we will work with you to tailor a learning pathway that suits your needs and career goals.

[ut.onl/mgeo-specialisations](https://ut.onl/mgeo-specialisations)



# CAREER PROSPECTS

Empowering you to achieve your career goals in the spatial data sciences.

## GEOSPATIAL KNOWLEDGE AND SKILLS

You will acquire essential skills in GIS, Earth Observation Sciences, and Data Sciences, including Artificial Intelligence and Machine Learning. These skills will enhance your technical and investigative capabilities, enabling you to translate technical knowledge into actionable policies and initiatives. You'll also have opportunities to connect with industry professionals through guest lectures, internships, and career fairs.

## PROFESSIONAL COMPETENCIES DEVELOPMENT

During the programme you will be given many opportunities to develop workplace competencies alongside academic and research based competencies. These skills can range from debating, communication in different formats and to a wide audience.

## WORK EXPERIENCE THROUGH INTERNSHIPS

To further enhance your career aspirations we also offer 15EC internships around the world, providing you with opportunities to grow your network while gaining experience.

## RESEARCH PROJECT

Lastly, during the research thesis phase of your masters you not only gain the necessary research and critical thinking skills useful for developing a project but also project management skills to ensure the successful execution of the project. All essential skills for consultancies, project development and management.

Whether you aspire to harness the latest geospatial technologies or innovate new ones, join us to acquire the skills needed to meet the growing demand in this exciting field.

[ut.onl/mgeo-career](https://ut.onl/mgeo-career)

# WHAT ELSE IS THERE TO KNOW?

There are a couple of things you should know before you apply for the Master in Geo-information Science and Earth Observation. In addition, you will find some nice-to-know information about this Master's. For example, the promising career prospects.

## TOP RESEARCH FACILITIES

The Faculty ITC is globally renowned for its research and development in geo-information science and Earth observation. As a student, you'll have access to topnotch lab facilities and resources, including:

- Centre of Expertise in Big GeoData Science
- Geospatial Computing Platform
- Visualisation and Usability Analysis Facility Lab
- Design and Interactive Space for Co-Creating Lab
- Drone Lab and UAV Centre
- Spectroscopy Lab
- Field Laboratories and Field Sites

[ut.onl/itc-facilities](https://ut.onl/itc-facilities)

During the programme, you'll use a variety of open-source tools (e.g., R, QGIS, Python, Jupyter Notebook, OpenDroneMap) and proprietary technologies (e.g., ESRI ArcGIS Pro, Enterprise; PiX4D, Cloud Compare). We emphasise the ethical use of geospatial information and technologies and promote open science, integrating these principles into your learning experience.

You'll have the chance to work alongside leading scientists and experts in the geo-information science and Earth observation fields. Due to our global reach with over 20,000 alumni around the world, you will be able to expand your network while gaining valuable hands-on experience that will enhance your future career!

## CAREER PROSPECTS

There is a global demand for experts in geographic information systems (GIS), spatial data science, and remote sensing. As a specialist in spatial data science, you will play a crucial role in developing data-driven sustainable solutions for issues like **climate change, biodiversity loss, energy transitions, food security, disaster resilience, and water management**. The skills and knowledge you acquire in this programme will enable you to work across disciplines for various national and international organisations.

Whether you aspire to harness the latest geospatial technologies or innovate new ones, join us to acquire the skills needed to meet the growing demand in this exciting field.

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## ADMISSION REQUIREMENTS

A bachelor's degree or an equivalent qualification from a recognised university or accredited institution in a related discipline. We warmly welcome recent graduates, working professionals, mid-career individuals, and career changers.

### Additional requirements

International Students: You must demonstrate English language proficiency with one of the following:

- Academic IELTS with an overall band score of at least 6.0,
- TOEFL iBT with a score of at least 80, or
- Cambridge C1 Advanced or C2 Proficiency

### Academic criteria

- A Cumulative Grade Point Average (CGPA) of 3.0 or higher on a 4.0 scale, or
- Upper Second Class standing or higher. (A Lower Second Class standing may be accepted with relevant professional experience or further academic development.)

### Online eligibility check

For students with non-Dutch diplomas, our online eligibility check helps determine your suitability for the Master's programme. It only takes about five minutes and provides a quick indication of your eligibility. Start the check today!


[ut.onl/mgeo-apply](https://ut.onl/mgeo-apply)


## GET IN TOUCH!


Questions about this stud programme? Whatever, your question is, we will be happy to help you.


Contact us [ut.onl/contact-education](https://ut.onl/contact-education)

Visit our website [ut.onl/m-geo](https://ut.onl/m-geo)

 **University of Twente**  
Enschede, the Netherlands

 [study@utwente.nl](mailto:study@utwente.nl)

 +31 (0)53489 5489

 +31 (0)6 51842633

# M.Sc. GEO-INFORMATION SCIENCE AND EARTH OBSERVATION

OF THE FACULTY ITC | UNIVERSITY OF TWENTE

## Natural Hazards and Disaster Risk Reduction Specialisation

UNIVERSITY  
OF TWENTE.



# Natural Hazards and Disaster Risk Reduction

## OF THE FACULTY ITC | UNIVERSITY OF TWENTE

**"This specialisation attracts students with a background in earth science, geography, civil engineering, and environmental science. They want to learn to use geospatial information and remote sensing technologies to study the different aspects of natural hazards and disaster risk. We prepare them to become experts in contributing to disaster risk reduction challenges."** - Bart Krol, Lecturer at ITC's department of Applied Earth Sciences

### WHAT IS NATURAL HAZARD AND DISASTER RISK REDUCTION

In this specialisation you will learn methods and strategies to analyse hydro-meteorological (floods, landslides, and erosion) and volcanic and seismic (earthquakes) hazard processes in geospatial context. The use of statistical and process-based models will help you answer questions such as: How do landslides develop? What conditions trigger the development of extreme weather events? Where can a flooding take place? You will also focus on geospatial approaches to conducting quantitative and qualitative risk analyses and providing this information to various stakeholders. This way, they can come up with risk reduction alternatives and analyse post-disaster solutions to increase communities' resilience to natural hazards. For instance, how can governments make communities less vulnerable to the effects of floods or develop neighbourhoods in such a way that they are less susceptible to landslides?

Thanks to the state-of-the-art geoscience labs, visualisation and usability labs, and satellite and sensor databases available at ITC, you will gain hands-on experience and work on real-life problems and solutions. You might analyse the root causes of extreme rainfalls in the Netherlands, Belgium, and Germany that have had serious repercussions for the communities in the affected areas and whether this can occur again in the future. Also, think of investigating the aftermath of a typhoon in the Philippines and predicting if it will hit the southern or northern part of the country next time, so you can provide this information to an organisation

### WHAT WILL YOU LEARN

As a graduate of the Master's in Geo-Information Science and Earth Observation with a specialisation in Natural Hazards and Disaster Risk Reduction, you have acquired specific scientific knowledge, skills, and values that will help you in your future career.

#### KNOWLEDGE

- a solid knowledge of Earth science and engineering concepts that support the understanding and prediction of natural hazard processes;
- a comprehensive understanding of geospatial data analysis and use modelling methods to evaluate how natural hazards and disaster risk may change in the context of global changes (climate change, land use, urbanisation);
- a fundamental understanding of the different disaster risk management components from an Earth science and geospatial information perspective.

#### SKILLS

- you can extract relevant information about hazards and risks by integrating multisource datasets, including remote sensing and field-based observations;
- you can combine different digital techniques and tools to acquire and process geospatial data, so you can identify, assess, and monitor hazardous processes and the disaster risk scenarios they can cause;
- you can contribute with your expertise to specialist teams that work on natural hazard assessment, disaster risk reduction, and post-disaster recovery.

#### VALUES

- maintain an attitude of independent and critical thinking in applying geo-information technology and when acquiring new scientific knowledge;
- have developed an interest in responding to changing demands and opportunities with creative solutions to make society more resilient;
- recognise your role as a geospatial hazard and risk information expert in multi-disciplinary environments and can contribute to disaster risk reduction solutions and related global challenges regarding raw material supply.



#### MORE INFORMATION

For more information, you can visit our website [ut.onl/xwvp4yk](http://ut.onl/xwvp4yk).

If you have any questions, please get in touch with us. We will get back to you as soon as possible.  
[b.virgilioportela@utwente.nl](mailto:b.virgilioportela@utwente.nl)

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