Civil Engineering and Applied Earth Sciences
Geoscience and Remote Sensing

MSc Programme

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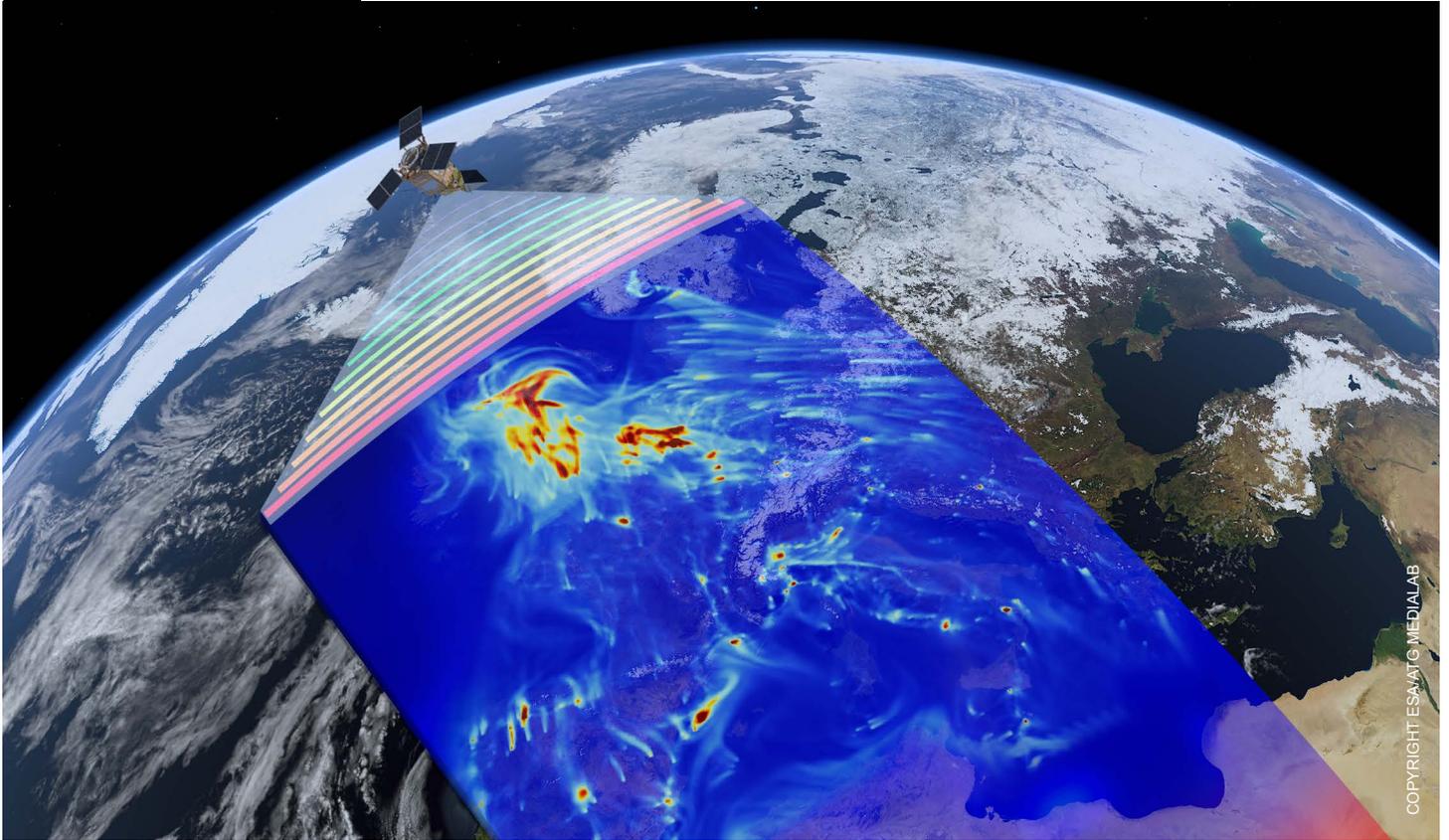
Our Earth is changing due to the growing population, urbanisation, natural geophysical processes, land use, and climate change. How can we improve our understanding of the underlying processes and make the right decisions for the future? In order to answer these questions we need advanced remote sensing technology, together with innovative data science and modelling techniques. This forms the basis of the MSc track Geoscience and Remote Sensing (GRS)

Degree	Master of Science
Starts	September
Type	full-time
Credits	120 ECTS, 24 months
Language	English
Application deadline	1 April: International students 1 July: Dutch degree
Tuition fee	€ 18.750 (non EU) € 2.168 (EU)
Scholarships	scholarships.tudelft.nl

Programme

The Geoscience and Remote Sensing MSc track is focused on advanced observation technology together with innovative geo-data analysis and modelling techniques. Together these can provide us with adequate information related to understanding, predicting and exploiting the Earth system, and for monitoring and surveying civil infrastructure. We need the empirical results and their interpretation to make the right decisions for the future of our planet. If you are interested in atmospheric sciences, geophysics, climate change, Earth observation, satellite technology, geodesy and other topics related to

geoscience, this is the MSc track for you. Students gain knowledge and skills relevant to remote sensing techniques, programming, analysis and visualization of remote sensing data, methods for modelling and simulation, and extraction of signals of interest for applications in engineering and geosciences.

The core of the programme comprises fundamental courses on geo-data acquisition and analysis, the physics of system Earth, and climate change. Hands-on activities, working with real data, are common in each of the courses. In the second phase, students can select from a suite of GRS electives plus additional electives from other tracks within Civil

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FIRST YEAR	SECOND YEAR
CORE COURSES (30 EC)	SPECIAL SUBJECTS (CHOOSE ONE) • ADDITIONAL GRADUATION WORK (10 EC) • INTERNSHIP (10 EC) • MULTIDISCIPLINARY PROJECT (10EC) • ELECTIVE COURSES (10 EC)
GRS ELECTIVES (27 EC)	ELECTIVE COURSES (10 EC)
FIELDWORK (3 EC)	MSC THESIS (40EC)

Engineering and Applied Earth Sciences. It is possible to do either an internship, additional thesis project or multidisciplinary project as well. A highlight of the programme is the fieldwork project, at the end of the first year. You will go to Northern Iceland and with a team of 10-12 GRS students you will design and execute a measurement campaign using different techniques. Moreover, you will do the data processing, analysis and interpretation in order to find out what the impact of volcanism, geothermal exploitation, plate spreading and other processes in terms of horizontal and vertical motions. The acquired team and project skills will be a great asset for your future career.

Student profile
Students choosing the GRS track are generally interested in geosciences, physics, mathematics and using programming tools.

Specialisation
After the second quarter you will choose your own elective programme. There is a lot of freedom in doing so. For example, you may wish to focus on Earth system science to understand how the system Earth works, analysing results of the latest satellite/ground based missions and analysing natural hazards, such as earthquakes and volcanoes, or the melting of the ice sheets and glaciers. Another option is to focus more on geodesy and remote sensing, which covers surveying, GPS for positioning and navigation, remote sensing techniques, acquiring and analysing geo-data in order to observe the Earth and to monitor civil infrastructure. A third option could be to focus on atmospheric sciences and climate change,

including meteorology, atmospheric chemistry, clouds and radiation, air quality and aerosols, and climate change modelling.

Graduation examples
• Modelling of mass transport in the Earth's system
• Antarctic surface melting dynamics using radar scatterometer data
• Monitoring utilities using satellite remote sensing and artificial intelligence
• 3D continuous change detection of sandy beaches
• Predicting heavy localized rainfall using supervised machine learning
• Using global climate model simulations to quantify changes in ocean heat content

Career prospects
Graduates from the GRS track serve the rapidly-growing market for accurate monitoring and mapping of our changing Earth and civil infrastructure. 55% of our graduates work in engineering and IT companies (e.g. Fugro, Arcadis, Sweco, CGI) or small- to medium-sized value-adding or surveying companies. 20% works in (semi-)governmental organisations such as Rijkswaterstaat, water boards, ministries and provinces, meteorological offices, TNO, Deltares or space organizations. 20% pursues a PhD for which there are ample opportunities both in The Netherlands as well as abroad.

34 first year students in 2020

32% international students

47% (male)

53% (female)

Career perspective

>90% job within 6 months

95% job related to GRS

50% internship / exchange abroad

20% of alumni working abroad

www.tudelft.nl/msc/aes/grs

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