

# Crossing Borders

## International Grand Challenges and Strategies for Technology, Sustainability and Development



This minor offers students opportunities to gain international experience by going abroad for a field study, a study tour, or by working from the Netherlands with international partners. Where possible, the student's disciplinary specialisation will be connected to the international project.

Students who intend to participate in an international study project find a clear and challenging framework in this minor to raise their knowledge and competences to a higher academic level. The design of the minor is framed around the various components related to International Grand Challenges. The educational goal of this minor is to contribute to your international orientation. Throughout the two modules you will learn about these challenges, and are encouraged to become aware of the importance of differences between your own country and other countries in terms of technology, socio-economic structures and culture. This will allow you to develop new insights into the world's challenges related to Technology, Sustainability and Development.

### **Purpose of the programme**

The minor Crossing Borders is grounded on the belief that the most important issues relating to a sustainable future are cross-disciplinary and system-thinking, education, creativity, and innovation. Tomorrow's professionals will have to be prepared to work and live in an international environment where they develop and implement innovations that will enhance their organization's capacity to address the challenges of Technology, Sustainability and

Development. In short: there is a need for flexible academics with an international outlook.

### **International Grand Challenges**

Our starting point in the minor are the International Grand Challenges. These challenges include:

(1) How to feed 9 billion people in 2050, on a planet that is heavily pressured by climate change, a lack of natural resources, acidified

oceans, and a shortage of **food** and fresh **water** (to name a few)?

(2) How to improve **energy** security that reduces both political tensions and environmental impacts?

(3) How can firms raise **productivity** in an environmentally friendly and socially equitable way while still being competitive?

(4) What role is to be played by governments – national, regional and international – to enhance **responsible innovative** solutions?

From physics to engineering, mathematics and computer science, the various disciplines in our university, all have much to contribute to these challenges and how we can address them. But politics and economics also will need to come in, for they provide instruments and boundary conditions. Our societal institutions may help, but also be the cause of inertia and limitations. In the end, we also need entrepreneurial people in small and large companies, in government departments and agencies, in fact everywhere, to develop innovative and sustainable solutions and approaches that contribute to addressing the challenges.

### **Grand Challenges call for Global Solutions**

The students in the minor ‘Crossing Borders’ will make use of a broad range of theories and integrated approaches in order to discuss innovative technological and business solutions, smart policies and – overall – responsible transitions to a sustainable future. Students will learn that innovations are not just technological in nature, but also have an important social (human) dimension. The adoption of

innovations relies on companies and entrepreneurs and it depends on opportunities provided by governments, higher education institutions and NGOs. This takes place in an increasingly globalized world and involves many stakeholders, each of them bringing in their own knowledge, interests and cultural backgrounds. Therefore, to implement responsible innovations requires an understanding of both policy processes and business processes, as well as the social and cultural contexts in which technological and governance solutions are to be applied. The students in the minor will work on cases in which they also learn to see the added value of disciplines other than their own degree programme.



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### **The structure of the minor**

The minor consists of two Modules. Each module consists of 15 EC’s.

## Module 1 (15 EC)

Module 1 has three distinct elements:

(1) **thematic sessions** offering multi-disciplinary perspectives and theories for tackling the international grand challenges; (2) self-guided cooperative **learning by teams** of students from different disciplinary backgrounds; (3) a project – a **group assignment** or study tour under the guidance of lecturers and partners from different UT faculties.

Module 1 allows a choice between three options in order to cover the practical component of the minor. This enables students to make the minor fit in with their study programme.

(a) In version A, students work on an international project with a foreign partner organization. Students will be based at the University of Twente (UT), thus experiencing ‘internationalization at home’. To communicate with the international partner they will make use of Skype/email/phone (hence the term ‘virtual’). The project work requires students to solve a practical problem (linked to one of the International Grand Challenges) proposed by an organization located outside Europe. This [link](#) provides some examples.

(b) In version B, students will go on a study tour co-organized with one of the UT’s study associations. They will visit one or two countries during a period of 2-3 weeks and experience cultural differences. Based on their study tour experiences, students will carry out a small research project and deliver a report on their work. This [link](#) provides some examples of previous study tours.

(c) Students choosing version C will do an extended field study which will start in Module 1 and will continue into Module 2 (see below). A large database containing a choice of host organizations from Asia, Africa, Latin America and other parts of the world is available for students to choose from. After a field study preparation, students will go abroad to their host organization and first carry out a preparatory study to learn about the organizational context. The preparatory study is the final project for Module 1. After successfully finishing this report, students will continue their field study abroad in Module 2. This [link](#) shows some examples of the field work that were carried out by students.



Findings from the final project carried out in each version will be included in a report to be delivered at the end of Module 1. Students will discuss the results with their tutors. The final report will be submitted for grading in the last week of the Quartile.

<b>Module 1 (15 EC)</b>		
<b>Version A: Virtual project</b>	<b>Version B: Study tour</b>	<b>Version C: Extended field study</b>
Grand Challenges, Globalisation and Foundations of Sustainable Development: Multi-disciplinary perspectives and theories		
Preparation of Virtual Project	Study tour preparation	Extended field study preparation
Virtual project	Study tour abroad	Extended field study project
Report on Virtual project	Report on study tour	Report on first part of field study
<b>Module 2 (15 EC)</b>		
<b>Version D: Continuation version A or B</b>	<b>Version E: Short field study</b>	Continuation extended field study abroad
Preparation of field study	Preparation of field study	
Field study 10 weeks (Includes 2 weeks Christmas holidays)	Field study 9 weeks (Includes 2 weeks Christmas holidays)	
Finalising report Module 2 (after return to the Netherlands)	Finalising report Module 2 (after return to the Netherlands)	
Finalising report Module 2 (after return to the Netherlands)	Finalising report Module 2 (after return to the Netherlands)	Finalising report Module 2 (after return to the Netherlands)

## Module 2 (15 EC):

In Module 2, students will go abroad for a field study related to the international Grand Challenges for Technology, Sustainability and Development (TSD). The field study, will inevitably be different for every student, since each field study takes place in a different organization and environment. Also, the length of the stay abroad differs and depends on the track chosen by the student in Module 1. This is shown in the diagram above. Most students in Module 2 will have taken part in Module 1.

The field study requires students to carry out a project. Depending on the size of a project, students can, individually or in a team (maximum: two students) carry out an assignment (research project) in a host organization during an 8 to 12 week period (holidays included). In the case of a team project, each student will have a different task. The project's goal will be connected to international Grand Challenges for TS&D. Students may connect the field study partly to their own study background.

The two objectives of the field study are:

- to have students experience what it means to work in an international environment with people coming from different (disciplinary and cultural) backgrounds;
- to provide useful results for the host organization.

There are two types of field studies:

1. Field studies in which the student is primarily carrying out a practical task suggested by the host organization (to which the student should add a research element of his/her own).

2. Field studies in which the student is primarily engaged in trying to answer a research question, although the student may also do some small practical activities for the host organization. In case of the latter, the practical activities should not take up more than 50% of the student's time. This [link](#) shows some examples of field work projects.



For all field studies, the following elements are compulsory:

- Before departure, students will prepare a suitable research proposal for their field study. For the students who take Module 2 independently of Module 1, the research proposal is a compulsory requirement. Students who took version C of Module 1 already obtained this knowledge in Module 1.
- Upon their return to the Netherlands, students have to write a final research report where they describe the outcomes of their field study, including their relevance for the host organization. The report has to meet

well-defined criteria (methodology, scientific foundation, etc.).

- Students themselves are responsible for finding and approaching a suitable host organization. To this end, an extensive database with potential host organizations is available. This and other practicalities will be presented during a lunch seminar in the first week of Quartile 1. After the seminar, students are to start making the necessary preparations and arrangements for their field study.

### **Planning and finance**

There is a Course Handbook on the university's Blackboard that includes a description of all the organizational matters and practical issues that need to be taken into account if you go abroad for field work or a study trip. It lists the arrangements you will need to make and shows examples of letters/emails that you have to write to host organizations. Students going abroad are encouraged to start planning their stay abroad as soon as possible.

Our university's [International Office](#) also provides some support for students going abroad. To finance your stay abroad, you may qualify for the [Twente Mobility Fund](#), for the [Holland Scholarship](#) or [other scholarship opportunities](#).

### **Coordination team**

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### **More**

**information** [www.utwente.nl/majorminor](http://www.utwente.nl/majorminor)

