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MINOR
MULTIFUNCTIONAL DESIGN OF NATURE-BASED FLOOD PROTECTION

In this module you will create and design a Multifunctional Flood Defence as an innovative solution for a real case. You will learn in-depth knowledge related to flood defence systems in combination with Nature-based Solutions and apply this knowledge in an interdisciplinary team and co-create a physical scale model for the study area.

WHAT IS A HTHT MINOR?

A HTHT-minor fits within the UT profile: High Tech, Human Touch. The minor is offered in English and accessible for both national and international students. The goal of the HTHT-minor is to illuminate specific societal themes for which the UT develops High Tech Human Touch solutions. These solutions are created by conducting high-quality research. Both the form and the content of the minors are High Tech Human Touch (multidisciplinary) and are profiling for the student.

The UT offers most HTHT-minors in a coherent package of 2 (30 EC). There are also HTHT minors of 15 EC that do not belong to a package. You can choose one of these minors and combine this with one minor of a package. If possible, you can even choose 2 minors from different packages.

MULTIFUNCTIONAL DESIGN OF NATURE-BASED COASTAL FLOOD PROTECTION

Nature-based Solutions (NbS) are novel solutions combining flood protection, natural dynamics and biodiversity goals. In this module, you learn to integrate knowledge from various scientific fields related to NbS and traditional flood defence systems, learn to co-design in an interdisciplinary team and learn to use expert knowledge to address real-world challenges from the Waterboard in close collaboration.

You will go in-depth into one of the state-of-the-art topics, related to Nature-based Solutions, while integrating their results in interdisciplinary teams. The end-product is to create a physical scale model of a Multifunctional Flood Defence as Nature-based Solution.

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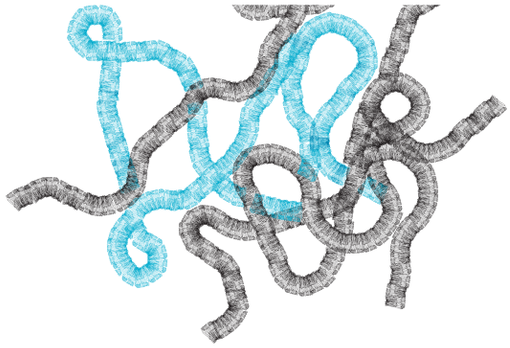

"I really liked, the collaboration with students from other studies and people with different expert topics"

EXAMPLES OF EXPERT TOPICS

Each team member works as an expert on one of the topics and acquires in-depth knowledge as input for the team design.
1) Systems Engineering: Stakeholder requirements need to be analysed and evaluated in the final design to the wishes of various actors including future changes.
2) Life cycle assessment (LCA) and ecosystem services (ES) are essential to quantify the benefits and costs of NbS.
3) Sandy Solution Dynamics: A dune area need to be designed to serve both flood protection and biodiversity goals while maintaining natural dynamics.
4) Living Foreshore Dynamics: vegetated foreshores (Living Dikes) can be applied to combine nature and flood safety goals.
5) Geotechnics Engineering. Both structural and soil-related measures are integrated in the flood defence, which requires integration of subsoil processes.
6) Multifunctional Flood Safety is changing the methods for assessing flood safety in case of Nature-based Solutions. Students apply state-of-the-art methods to ensure safety against flooding.

MODULE OUTLINE

The study area is divided into different sections. Each team consists of around six students and is responsible for the design of one of the sections of the study area. Each team member works as an expert on one of the topics. The experts from the different teams work together to exchange knowledge and learn from each other during expert meetings, supervised by an expert teacher. The designs and requirements are exchanged between the teams during plenary sessions. In this minor you will learn to work in interdisciplinary teams, with students of different backgrounds in a real-world setting. Learning to plan the design and work process is essential in this module. Regular meetings are scheduled with Waterboard representatives, including an excursion to the study area.

MODULE ORGANIZATION AND ASSESSMENT

The first two weeks of the module are used for introducing the study area and the expert topics in (guest) lectures. Students define their preliminary design requirements, discussed in team sessions and a plenary session at the end of the second week. The preliminary design requirements are graded based on a written team report.

In the middle part of the module, alternative designs are developed. The students work both on their topic as experts and on the project simultaneously. Supervised meetings are scheduled to exchange knowledge, stimulate integration and provide guidance. Teaching staff is regularly available for questions. Also, plenary sessions are scheduled to discuss challenges and stimulate cooperation towards the final design. The results are presented in a draft team report and a (graded) draft individual expert report

The last two weeks of the module are dedicated to integration, visualization and evaluation of the final design. In these weeks you work in the Workshop of the Design Lab, to construct an integrated physical model of your final design (see figure on the front page). We challenge you to improve the designs from last year and make it even more stunningly beautiful, feasible and desirable by the stakeholders. The final

MORE INFORMATION

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www.utwente.nl/minor