MINOR
SMART SOLUTIONS FOR SUSTAINABLE CITIES

Sustainable Cities are appealing to scientists, engineers, and city governors. But what are they, and how do they influence civil engineering practice? This course explores the concept through SC-theory (30% of the time spent) and focuses on an elective design project (70%) in smart cities, green infrastructure, mapping, machine learning for buildings and automated construction. Will you help civil engineers develop sustainable cities?

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.

Current thinking about Sustainable Cities often results in the development of exciting blueprint images of futuristic cities, but it also raises fundamental questions, such as what are Sustainable Cities? And, how realistic are these concepts? This module demystifies the Sustainable City concept and designs smart solutions for supporting Civil Engineering processes in cities.
In the course, you will study Sustainable City the concept from a multi-disciplinary perspective. You will learn how the construction of Sustainable Cities affects the physical urban built environment, and – most importantly – you will get to know whether and how such smart solutions can be implemented in existing city space.
After a mere high-level governance and management part that covers the Sustainable City concept, we address specific technology and engineering projects that, altogether, aim to make construction projects in cities better/smarter/faster/less disruptive.
The ten-week module takes place in the November-January quartile and constitutes two main parts. In the

UNIVERSITY OF TWENTE.
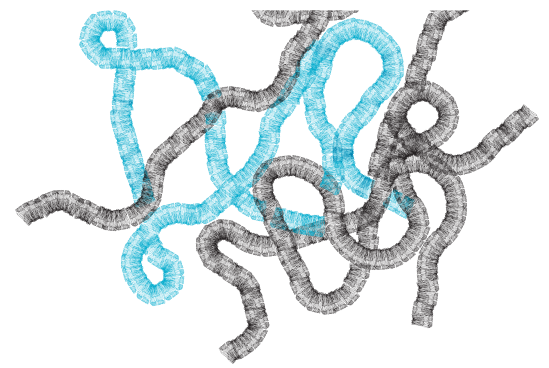
We zoom in from Sustainable City concepts to a specialized design project!

first part, lectures will introduce a broad perspective on the Sustainable City concept. Besides, this, lectures will give a basic about concepts and methods for geo-engineering, geophysics, smart buildings, machine learning and construction, and green infrastructure. Deepening of this knowledge from lectures takes place through self-study and application in a group project. Throughout the course, you get the maximum flexibility to schedule self-study moments yourself.

After the multi-disciplinary introduction to Sustainable Cities, the course zooms in on a range of problems in existing city engineering processes. These problems relate to ongoing infrastructure research in the Civil Engineering dept., and the ZoARG | ReDUCE Center (www.zoarg.com). You will work in multidisciplinary groups to solve a selected real-life problem and report the solution to client. The clients pitches the problems that you can work on during an introductory session. Together, UTtutors and clients co-supervise your design project. You also get two workshops in human-centered design and systems engineering to learn about structured design methodologies.

Examples of industry-led projects from the past are about generating designs for: (1) an underground campus facility; (2) a buried pipeline inspection system; (3) a mobile transportation data app; (4) a construction site safety system; (5) a virtual excavator operator simulator; (6) an underground remote sensing system; and (7) a sensor network for measuring green infrastructure performance.

In sum, the module both introduces Sustainable Cities and gets hands-on by letting you solve a very specific Smart City Engineering-related engineering problem for real-life companies. Besides pass-fail moments, the course assesses you based on an individual digital exam and one group design assignment.

MORE INFORMATION
Minor coordinator:
Dr. Sean Vrielink
Horst, Z236
T: 053 489 8682
E: k.vink@utwente.nl

For more information about this minor and for general information about minors:
www.utwente.nl/minor