Course Guide

International Minor Programme on Smart Sustainable Cities

2026 - 2027

HU University of Applied Sciences Utrecht

International Minor Programme on Smart Sustainable Cities (TIGO-MSSC-18)

Since the beginning of the 21st Century the majority of the world population lives in an urban area. That is not so strange, because cities are the attractive places where more and more people want to live, work and relax. Cities are increasingly becoming the 'engine of our economy'; Cities are the creative spots where you can develop yourself; and Cities offer art, entertainment, and culture.

However, there are also important challenges for the cities of the future. How do we solve problems related to energy, mobility and waste in the city? How do we ensure that new innovative business will provide sufficient employment in the city? How do we ensure inclusiveness, participation and tolerance in the city? How can we solve that in a smart way, for example with the help of ICT?

These questions challenge us to develop integrated sustainable solutions for economie, social and environmental problems. The future of humankind depends to a great extent on whether we will be able to boost the sustainable development of cities. Are you concerned? Please join the minor programme on Smart Sustainable Cities (30 ECTS) and become the smart sustainable city professional of the future.

Learning Outcomes

You work on the analysis of Smart Sustainable Cities (SSC) challenges, the design of SSC solutions and the evaluation of their feasibility. These sustainability challenges are complex but reasonably structured, the available methods are known, the context is multidisciplinary and situated in practice, and coaching supervision is available. After successfully completing this course, you can:

- analyze a given urban situation in terms of community needs, (built) environment and processes;
- propose hands-on, innovative, smart, creative and viable solutions and recommendations;
- apply a set of analytical, design and project management skills and the knowledge gained from instructions and workshops;
- work successfully in an interdisciplinary and international team, comparing, analyzing and combining your own and others' ideas and solutions;
- develop communicative skills (presenting, writing, discussing) and personal/professional skills for life-long learning (reflection skills, personal development plan, critical thinking)
- critically evaluate the quality of the solutions proposed.

Summative assessments

This programme will be awarded with 2 x 15 ECTS. There are 2 x 4 different summative assessments:

- Test
- Research plan
- Final Report
- Portfolio with personal assignments and reflections
- Final presentation and poster

The credits will only be awarded if you have submitted and undertaken all requested non-rated (formative) tasks before.
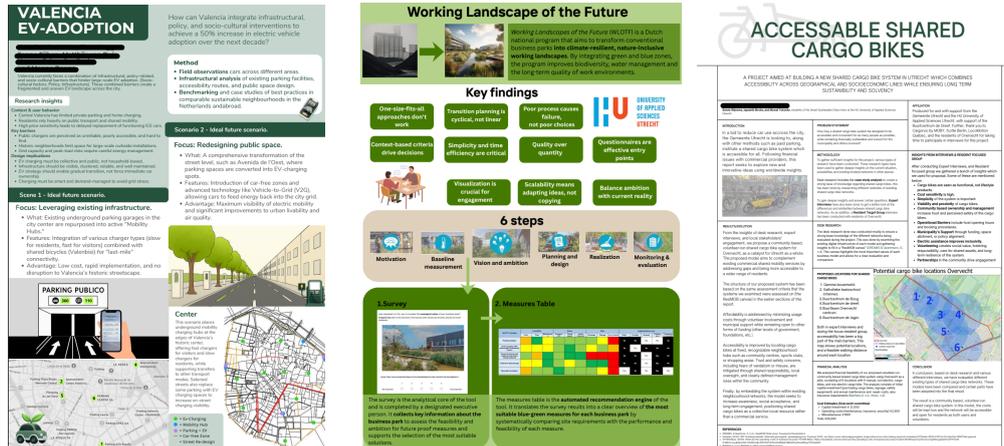
Examples of final poster presentations

Course structure

The minor programma Smart Sustainable Cities is a one semester programma of 20 weeks (30 ECTS). It consists of two courses 15 ECTS each: the Smart Sustainable City course and Sustainability Challenge.

- In the cursory part of the minor (15EC) you will learn about the ins and outs of Smart Sustainable Cities, you will learn more about energy, mobility, circular economy and healthy living in various workshops, and you will learn how to apply relevant methods and techniques for researching, designing and advising on / about Smart Sustainable Cities. The latter includes for example the building blocks for social design, business model canvas, entrepreneurial skills, co-design techniques, research skills. Excursions to best practices are also part of the programme.
- During the Sustainability Challenge (15EC), you will work independently in a team on behalf of a real commissioner (for example the municipality). You will *explore* the sustainability challenge that they are facing, you will *design* smart, creative and innovative solutions for this challenge and *advise* how this can be converted into a viable commercial proposition. You are of course also responsible for the *project management.* These assignments all have a *multidisciplinary* character. Every student can therefore contribute to the solution from his or her own discipline.

Example projects

Examples of past projects are:
- Valencia (Spain): How can an urban neighborhood in Valencia be re-designed to accommodate for a higher adoption rate of Electrical Vehicles (EV's)?
- Utrecht (the Netherlands): How can we optimise zoning measures to reduce energy use at the HU buildings at the Utrecht Science Park?
- Turku (Finland): How can the charging system of an electrified public bus network in Turku be arranged in order to contribute efficiently to the carbon neutrality goals?
- Utrecht (the Netherlands): How can the municipality of Utrecht utilise their plastic waste in the public space to add value as a circular city?
- Manchester (United Kingdom): How can an effective marketing campaign to promote cycling in the Greater Manchester region be designed?

Course materials

- Rietbergen, M.G., R. van Stigt, E-J. Velzing (2021). Smart Sustainable Cities - a handbook tor applied research. HU University of Applied Science Utrecht, Utrecht, The Netherlands. ISBN: 9789089281494.

Going abroad

During this minor you will get the unique opportunity to go abroad tor a short period (around 4 weeks). You will work on one of the 'Sustainability Challenges' tor consortia in various municipalities, for instance Valencia / Alcoy (Spain), Turku (Finland), Manchester (UK) or Utrecht (Netherlands). The actual offer of projects (and countries) may be different each year. The casts tor travel and accommodation are tor your account. Students that have a full time registration at HU may be eligible for ERASMUS+ short term mobility funding.

Entry requirements

This multidisciplinary minor is open to all students who are interested in the development of smart sustainable cities. Your previous education preferably has common ground with the themes people (inclusiveness, participation, policy), planet (energy, mobility, and circularity), profit (business models, marketing/ communication) and smart (big data, ICTs).

Language

This minor is taught in English. Language requirements is English CEFR level B2. Please note: You may be asked to take a language assessment test betore the start of the programme. If your English language skills are below the required level, you may not be able to enter the course, as you need to be

able to actively participate **in** (parts of) the programme. In all cases, the programme manager makes the final decision.

Student experiences

Stefan Räther and **Lennart Pusch** from the Hamburg University of Applied Sciences attended the ESSENCE course on Smart Sustainable Cities. They bath participated in the Alcoy traffic project.

Project abroad: Stefan Räther explains: "Spending time in Alcoy to help with sa/ving the C02 problem as a result of the dense traffic was an enriching experience. Being present in person really makes a difference. It changes your perception when you can see and fee/ the problem. That is very different from just reading about it, or hearing about other people 's experiences with regard to the problem. It was a chai/enge to identify the problems and to understand the inhabitants. We noticed how hard it is not to use a car in A/coy. The chai/enge was to make it more attractive for the inhabitants of the city to walk, so they wil/ use their cars /ess aften than they do naw."

Practical approach: "We real/y feit like being consultants working on a project for our c/ient, the /oca/ government", Stefan Räther continues. "We e/aborated some ideas the residents can use in a simpte way, for example the idea of walking distance maps of the city. There are cire/es on the map that indicate: this is a five-minute walk, this is a ten minute walk, this is a fifteen minute walk. People in Alcoy aften suppose: oh, that is much toa far to walk! We wanted them to be aware that their destinations are aften much nearer than they think."

Learning atmosphere: "I liked the atmosphere of learning, because everybody could choose a topic for themse/ves and was real/y eager to dive into it", Lennart Pusch explains. "It was interesting to have different approaches to learning from all over Europe. The fact that the teachers in Utrecht are very informal in their attitude towards the students was new to me. They would just hang out and talk to you. In Germany teachers are much more distant and we call them only by their last name. I liked it the Dutch way, but I have to admit that students might work a bit harder when there is more distance."

Coördinator

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More information

https://www.internationalhu.com/exchange-programmes/smart-sustainable-cities