Course Guide

International Minor Programme on Smart Sustainable Cities

2023 – 2024

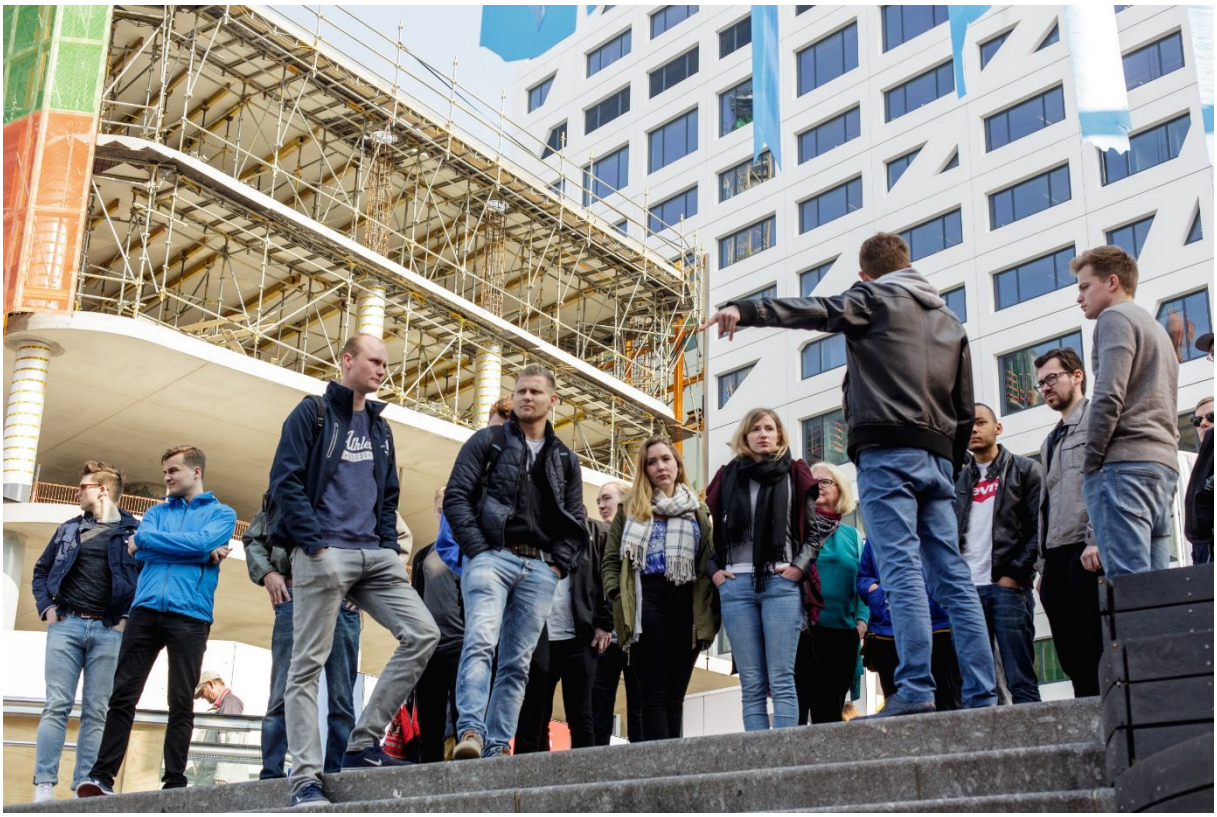
University of Applied Science Utrecht

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 economic, 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

The students will work on the analysis of SSC challenges, the design of SSC solutions and the evaluation of its feasibility. These sustainability challenges are complex but reasonably structured, the available methods are known, the context is multidisciplinary and situated in practise, and coaching supervision is available. After successfully completing this course, students can:

- Demonstrate understanding of the Smart Sustainable Cities (SSC) concept, (and its drivers & barriers) by using the triple bottom line approach (social sustainability, planetary limits, and economic viability) of urban challenges / discussing the potential role of ICT, by using reliable sources and perform valid research as a means to solve the urban sustainability challenge.
- Demonstrate capability to analyse a sustainability city challenge, by using methods such as the 5W approach, stakeholder analysis, mind mapping, argument mapping, cause-effect relations, reframing with the purpose to describe this challenge in a sound, clear, convincing and concise manner to the commissioner.

- Demonstrate the ability to apply the business model canvas with the purpose to develop a Smart Sustainable City product/service idea into a viable business concept.
- Demonstrate the ability to apply design research techniques (including reframing the initial question, generative techniques and co-design techniques) to design innovative, creative and smart solutions to solve complex challenges in urban areas.
- Demonstrate the capability to apply a wide variety of research methods, skills and techniques (SWOT, MCA, Impact Assessment, Scenario Analysis, Cost Benefit Analysis, Interview, survey, desk research) to analyse SSC challenges, design SSC solutions, and evaluate their feasibility in a substantiated way.
- Demonstrate the ability to use communicative skills (presenting, writing, discussing) to work effectively, to provide management and leadership skills to run the project efficiently, and to develop personal / professional skills for life-long learning (reflection skills, personal development plan, critical thinking).
- Demonstrate the ability to apply basic concepts, theories and methods for energy analysis, traffic and transport analysis, and the circular economy for designing Smart Sustainable City solutions.
- Students demonstrate the ability to establish a plan for behavior change when introducing a (smart) sustainable solution, applying methods like I-change model and theory of planned behaviour.

Summative assessments

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

- 2 x Research plan 10%, (PASS/FAIL)
- 2 x Final Report 50% (min. 5,5/10)
- 2 x Self and Peer Assessment 20% (min. 5,5/10)
- 2 x Presentation 20% (min. 5,5/10)

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

Course structure

The minor programme Smart Sustainable Cities is a one semester programme of 20 weeks (30 ECTS). It consists of two courses 15 ECTS each: The Smart Sustainable City course (TIGO-MSSCSSC-18) and Sustainability Challenge (TIGO-MSSCPRJ-18).

- 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 and circular economy in various workshops, and finally 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

- Alcoy (Spain): How can a substantial reduction in CO2 emissions from traffic in the city of Alcoy be achieved?
- Utrecht (the Netherlands): In what way can the Tuindorp-Oost district of the city of Utrecht be converted into an energy-neutral district in 2030?
- Soesterberg (the Netherlands): How can an autonomous Shuttle bus become a feasible transport option for the Soesterberg area?
- Utrecht (the Netherlands): How can the municipality of Utrecht utilize their plastic waste in the public space to add value for a circular city?
- Hanoi (Vietnam): How can the concept of Lighting as a Service be introduced in Vietnam successfully?

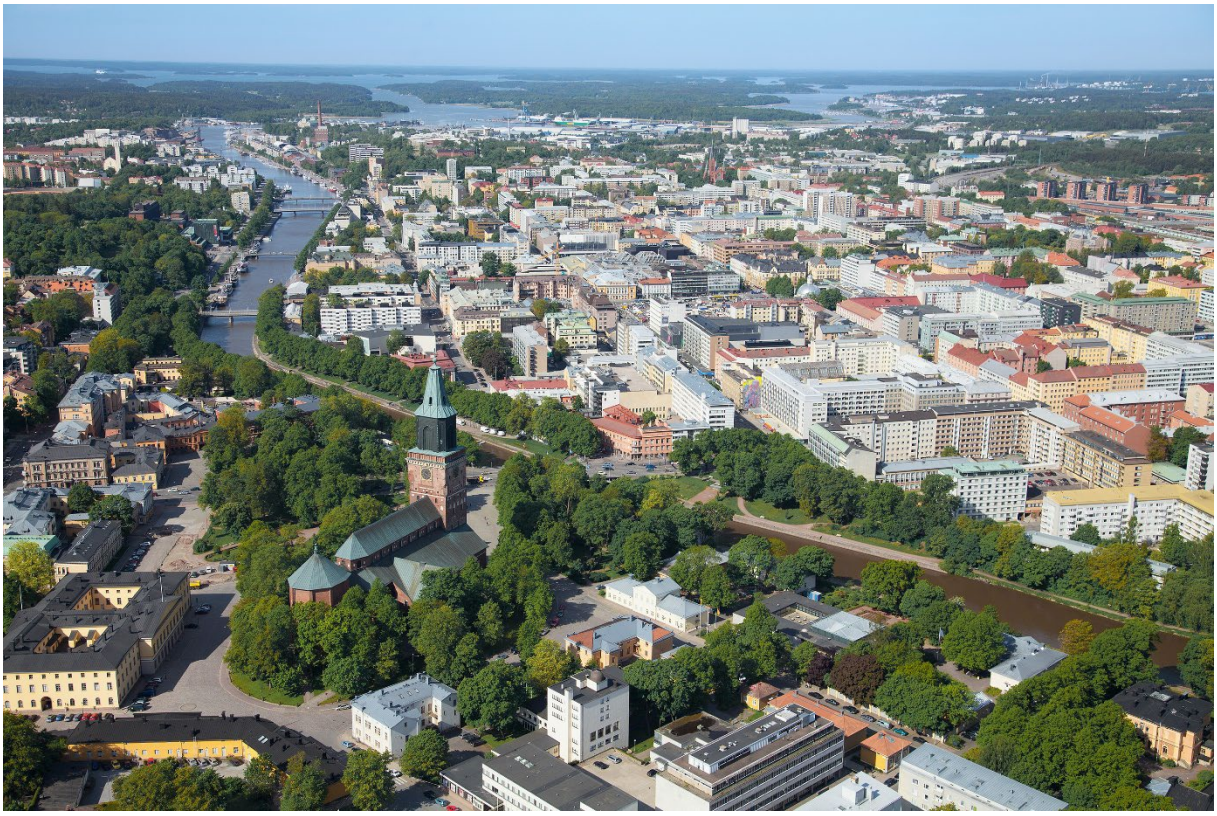
- Manchester (United Kingdom): How can an effective marketing campaign to promote cycling in the Greater Manchester region be designed?
- San Jose (Costa Rica): How can the green corridors be developed as inter-urban connections in the San Jose metropolitan area?

Course materials

Rietbergen, M.G., R. van Stigt, E-J. Velzing (2021). Smart Sustainable Cities – a handbook for 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 for a short period. You will work on one of the 'Sustainability Challenges' for consortia in the municipality of Alcoy (Spain), Turku (Finland), Manchester (UK), Hanoi (Vietnam), San Jose (Costa Rica) or Utrecht (Netherlands). The costs for travel and accommodation are for your account. Students that have a full time registration at HU may eligible for ERASMUS+ short term mobility funding.



ESSENCE

The minor has been developed within the ERASMUS + project ESSENCE (European Sustainable Solutions for Existing and New City Environments) by the five partners in the CARPE network: TUAS (Turku, Finland), UPV (Valencia, Spain), MMU (Manchester, United Kingdom), HAW (Hamburg, Germany) and the HU (Utrecht, the Netherlands). See www.essence.hu.nl.

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 before 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.

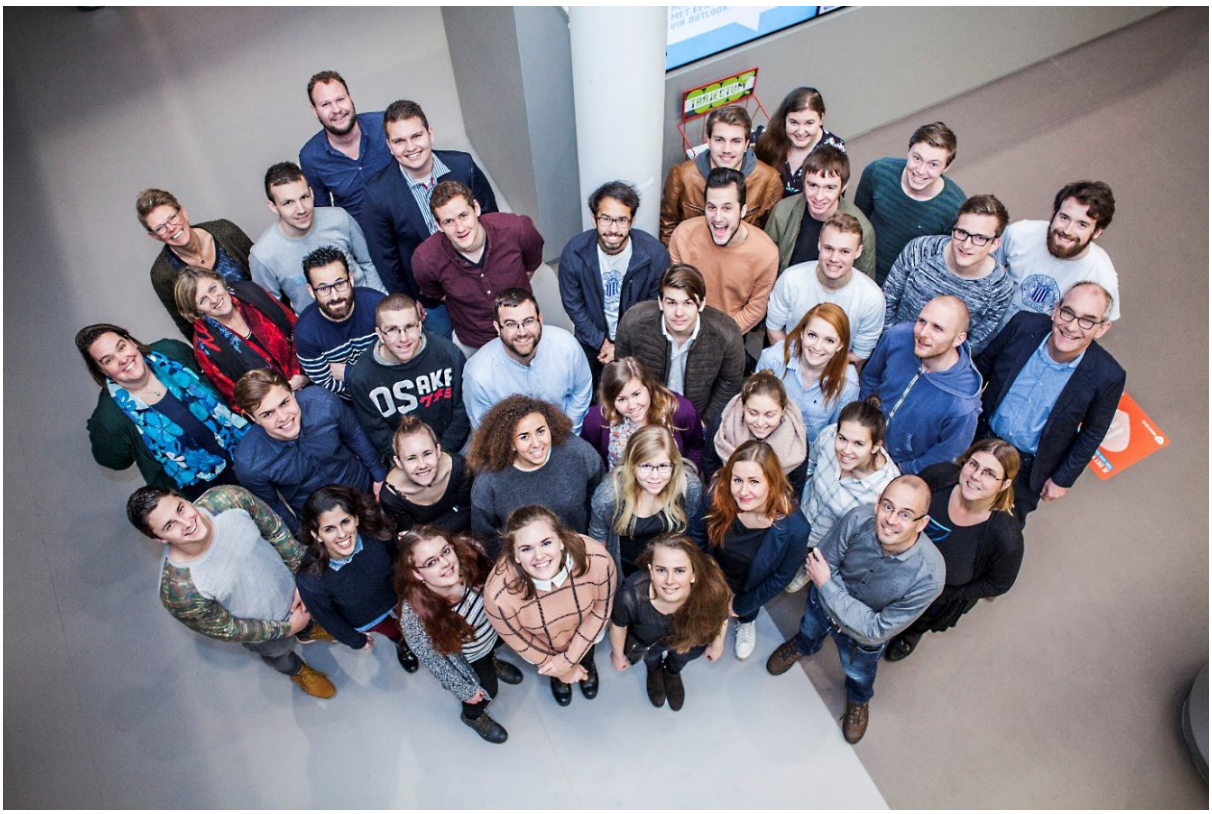
Student experiences

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

Project abroad: *Stefan Räther explains: "Spending time in Alcoy to help with solving the CO_2 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 feel 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 challenge to identify the problems and to understand the inhabitants. We noticed how hard it is not to use a car in Alcoy. The challenge was to make it more attractive for the inhabitants of the city to walk, so they will use their cars less often than they do now."*

Practical approach: *"We really felt like being consultants working on a project for our client, the local government", Stefan Räther continues. "We elaborated some ideas the residents can use in a simple way, for example the idea of walking distance maps of the city. There are circles 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 often suppose: oh, that is much too far to walk! We wanted them to be aware that their destinations are often much nearer than they think."*

Learning atmosphere: *"I liked the atmosphere of learning, because everybody could choose a topic for themselves and was really 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

Application deadline

1 May 2023