

Course Catalogue Engineering and ICT

EXCHANGE PROGRAMME

Future Cities + Regenerative Architecture / Water Management

2026-2027

*University of
Applied Sciences*

Windesheim



Course summary

VOE Code: BT.FC.V25

ECTS credits: 15

Level: Bachelor's degree (full-time)

Course Title	Future Cities
Type	Compulsory
Learning competences	
Learning outcomes	After this module you can work in multidisciplinary, international teams on integral solutions for urban challenges in 2075 regarding climate change, circular economy and population growth. You studied and designed future solutions that enhance the quality of life, cut cities' carbon emissions and build resilience to extreme weather. Next to that you enhanced your professional and cooperation skills by working in intercultural teams (discipline and nationality), by interacting with external stakeholders and by reflecting on your personal development.
Course content	<p>Courses</p> <p>Kick off Future Cities Getting to know each other and kick off for the projects and courses in the module. Lectures, excursions, workshops and a welcome party.</p> <p>Project Future Cities You will work in an interdisciplinary team of international students on an integral design research for a city district in 2075. You research and design future solutions that enhance the quality of life, cut cities' carbon emissions and build resilience to extreme weather.</p> <p>Lectures & Field Trip In this course you will gain knowledge for your studio project by attending presentations of keynote speakers of different expertise. You will stay in a European city outside the Netherlands for a few days to understand, feel and experience such a particular city. We will visit interesting projects, exhibitions, etc. You will participate in organizing and preparing the field trip.</p> <p>Personal Leadership In this course you will be working on your soft skills, which will be crucial for your success in the workplace. You will learn to take the lead in your own development and you will receive tools for fruitful cooperation and communication with others. This will take place via (mandatory) interactive workshops which will encourage you to get out of your comfort zone now and then. You will round off this course by means of an assessment in which you will reflect on your own development.</p>
Planned learning activities and teaching methods	<p>(Guest) lectures, projectgroups, workshops, seminars, excursions, presentations.</p> <p>The future is challenging the way we build our cities. In this module you will work in interdisciplinary teams on an integral design research for a city district in 2075. You research and design future solutions that enhance the quality of life, cut cities' carbon emissions and build resilience to extreme weather. You research critical infrastructure services like mobility, energy, food, water and waste and its impact on the urban structure and public space.</p> <p>Guest speakers from the industry of smart mobility, alternative energy, waste flows, water management, smart cities, etcetera will share their knowledge and experience to support you in your project work. You will visit and investigate interesting projects on field trips in the Netherlands and abroad.</p> <p>In this module you will work in an inspiring and challenging international environment. You will develop your skills in cross-cultural communication and teamwork through the course Intercultural Awareness.</p>
Recommended or required reading and other learning resources / tools	A laptop as used during the study with the software which is used during the study (to fulfil the curriculum from Architecture/Civil Engineering/Spatial Planning or their 'own' study in their home country).

Prerequisites and co-requisites	You are required to have two years of Bachelor's study experience in Architecture/ Architectural Engineering, Construction Engineering, Civil Engineering, Spatial Planning & Traffic Engineering or a similar course and English-language skills at B2 level.		
Level	Advanced		
Grading scale	1 up to 10, 1 dec.		
Assessment methods and criteria	Type of assessment	Grade weighting	Criteria
	Kick off week group	0.08	Higher or equal to 5.5
	Lectures & Field trips	0.35	Higher or equal to 5.5
	Project Future Cities group	0.4	Higher or equal to 5.5
	Personal Leadership	0.17	Higher or equal to 5.5
Language of Instruction	English		
Name of lecturer	For information about the lecturers you can contact Almar Meijerink		
Mode of delivery	Face to face		

Course summary	
VOE Code: BT.RA.V26	ECTS credits: 15
Level: Bachelor's degree (full-time)	
Course Title	Regenerative Architecture
Type	Optional
Learning competences	
Learning outcomes	<p>In this module you work in an international team. In the module you will learn to design a regenerative building based on regenerative principles. After research and forming your mission and ambition statement you design an preliminary and technical design reacting on your analysis and research. You work as an independent professional within a team in a professional environment, under the supervision of an experienced professional. The fully substantiated analysis document and fully substantiated structure/preliminary and final design serve as input for a technical design file (TO)</p> <p>You do this at an average to high level.</p>
Course content	<p>The course contains an multidisciplinary project where you work in an international team of students. Individual and group tasks are combined in the following topics:</p> <p><u>Research project</u> In the introduction you will research in the topics of circularity, sustainability and regenerative design. This will be the starting point for the assignment.</p> <p><u>Lectures and excursions</u> For this aspect you will gain knowledge for your studio project by attending presentations of keynote speakers on circular building and regenerative concepts. This includes topics such as circular construction and installation principles, nature inclusive and regenerative design, the use of circular and biodegradable building materials, shadow costs and residual value. You will visit interesting projects and organizations during excursions in the Netherlands and possibly abroad. You will participate in organizing and preparing these excursions.</p> <p><u>Project Design</u> You will work in a multidisciplinary team of international students on a regenerative design project. Your task is to come up with concepts and ideas for regenerative architecture. This studio project is at the heart of this programme. It is supported by complementary lectures in which you will develop your creative and technical skills and knowledge on circular building and regenerative architecture.</p> <p><u>Project Technical implementation</u> This aspect provides more detailed knowledge on sustainable, circular and regenerative materials. You will find out what selection criteria are and how to apply them in a building</p>

	<p>according to the regulations.</p> <p>As an engineer, you will need to develop buildings with regenerative aspects. One of the assignments is therefore to create a reusable construction.</p> <p>To gain insight in the circular, sustainable and regenerative aspect of your design you will also make measurements on the ambition for your design. Does it meet the Paris agreements, what is the CO2 production (Whole life Carbon), what score do you achieve of circularity? The latest measuring aspects will be taught in this course and you will gain knowledge how to correctly implement the aspects.</p> <p>Learning goals</p> <ul style="list-style-type: none"> • Able to work together in international teams • Thinking outside the box and being creative • Acquiring an investigative attitude (context, program, reference projects, possibilities, solutions, etc.) • Developing new spatial strategies/concepts • Translating a spatial strategy/concept into a spatial design • Research current sustainable and regenerative solutions • The technical development of the design in relation to vision and concept 		
Planned learning activities and teaching methods	<p>(Guest) lectures, projectgroups, workshops, seminars, excursions, presentations.</p> <p>You research the current demands for sustainability and formulate a design ambition for an integral solution for the building demand.</p> <p>You use scientific insight from recent research on aspect of circular, regenerative and sustainable design solutions for the building industry (architectural and technical) in your design.</p> <p>The implemented design solutions are related to the latest researches and are measurable according to these solutions. You evaluate your design through measurable criteria in relation to your initial design ambition and draw conclusions.</p> <p>In an international team of student and individually, you work under supervision of an experienced teacher. In a highly complex situation where you enrich your research with excursions to progressive companies.</p> <p>Your design, architectural and technical aspects, meets the required sustainable solutions and you have proven your ambition with measurable aspects regarding your research.</p>		
Recommended or required reading and other learning resources / tools	<ul style="list-style-type: none"> • A laptop as used during the study with the software which is used during the study (to fulfil the curriculum from Architecture/Civil Engineering/Spatial Planning or their 'own' study in their home country). • E-Learning environment. • Safety boots for excursions to building sites 		
Prerequisites and co-requisites	<p>You are required to have two years of Bachelor's study experience in Architecture/ Architectural Engineering, Construction Engineering or a similar course and English-language skills at B2 level.</p>		
Level	Advanced		
Grading scale	1 up to 10, 1 dec.		
Assessment methods and criteria	Type of assessment	Grade weighting	Criteria
	1. Research project (individual)	0.5	Higher or equal to 5.5
	2. Design Project (group)	0.5	Higher or equal to 5.5
Language of Instruction	English		
Name of lecturer	For information about the lecturers you can contact Micha van Boheemen (t.m.van.boheemen@windesheim.nl)		
Mode of delivery	Face to face		

VOE Code: BT.WM.V25		ECTS credits: 15		Level: Bachelor's degree (full-time)	
Course Title	Water Management				
Type	Optional				
Learning competences					
Learning outcomes	<p>You work on a water management project and translate complex challenges into a professional advisory or design report. You apply hydrological and geohydrological principles in modeling and analyzing water flows. You develop and implement hydraulic models for water management and integrate them into future-proof strategies. Additionally, you apply Nature-Based Solutions and adaptive design methods to create sustainable and resilient water management solutions. You reflect on your professional development and contribute to innovative, interdisciplinary water management approaches.</p>				
Course content	<p>You will work on four topics in this module:</p> <p><u>1. Geohydrology and hydrology</u> You study hydrological and geohydrological principles in modeling and analyzing water flows. You engage in a practical exercise to apply theoretical concepts to a real-world case.</p> <p><u>2. Nature-based Solutions</u> You explore engineering approaches inspired by natural processes to address flooding and drought. By applying scenarios and adaptive design you design flexible strategies.</p> <p><u>3. Geo-spatial water modelling</u> You will build your own GIS-based surface water run-off model and use it to assess the impact of measures designed in your project.</p> <p><u>4. Sponge landscape project</u> You will apply this knowledge to keep the region of Zwolle safe from floods and droughts. You examine the issue, develop solutions and present these and reflect on your professional development and contribution to innovative, interdisciplinary water management approaches.</p>				
Planned learning activities and teaching methods	Lectures, projectwork and project assistance				
Recommended or required reading and other learning resources / tools					
Prerequisites and co-requisites	You are required to have two years of Bachelor's study experience in Civil Engineering or a similar course (with knowledge of hydraulic engineering or fluid dynamics) and English-language skills at B2 level.				
Level	Advanced				
Grading scale	1 up to 10, 1 dec.				
Assessment methods and criteria	Type of assessment	Grade weighting	Criteria		
	WM-(Geo-)hydrology (topic 1)	0.25	Higher or equal to 5.5		
	WM-Project (topic 2, 3, 4)	0.75	Higher or equal to 5.5		
Language of Instruction	English				
Name of lecturer	For information about the lecturers you can contact Reginald Grendelman				
Mode of delivery	Face to face				