Water Management

Aquatic Ecotechnology

Delta Management

Spatial Planning & Design

Information for exchange student

2025-2026

Contents

General information for exchange students in the programme Water Management

Exchange students can either choose to follow courses from our Water Management programme or work on a real project (30ECTS) related to our study programme.

Courses in English

The Bachelor study of Water Management is a four year, applied bachelor study programme. Exchange students choose from a selection of courses from the study programme with a total study load of 30 ECTs per semester.
Semesters 3, 5 and 7 are from 1st of September up to end of January (fall semester).
Semesters 2, 4 and 6 from 1st of February to end of June (spring semester).

Semester 3 and 4 are 2nd year courses; Semester 5 and 6 are 3rd year courses (minor project); Semester 7 is 4th year courses.

English courses offered in 3 specializations.

The Bachelor of Water Management is one study programme with three different specializations, Aquatic Ecotechnology, Delta Management and Spatial Planning & Design.

We advise to choose all courses from the same semester of one academic year and of one specialization, to prevent that courses overlap in the schedule. If you choose a mixture of two or even more semesters and specializations the lectures might be scheduled at the same time and also the level will be different per semester. It is most of the time not possible to attend all lectures. Therefore, if you choose a mix, we advise you to have extra courses in your Learning Agreement, which have been approved by your home institute, so that you have a 'back up' plan if courses do overlap in the schedule.

More detailed information on the study programme can also be found on the website and in our study programme regulation.

Course offer Specialization Aquatic Ecotechnology:

Semester	Modules	ECTS
3	Ecological Water Quality Water Pollution & Treatment	15 12.5
4	Hydrology Ecological Engineering	12.5 12.5
7	Integrated Coastal Challenge (multi-disciplinary project) Aquaculture Ecological Risk Assessment Advanced Water Technology Urban Water and Asset Management	10 10 10 10 10

Detailed course descriptions as from page 6.

Course offer Specialization Delta Management:

Semester	Modules	ECTS
3	Vision development (applied in European Deltas) Adaptive Planning for Climate Change (applied in European Deltas)	15 12,5
4	Risk and Disaster Management (applied in the Elbe river basin) Strategic planning for resilient Deltas (applied in the Elbe river basin)	12,5 12,5
7	System analysis & Planning for circularity (applied in Mekong Delta) Coastal Challenge	20 10

Detailed course descriptions as from page 21.The names of the blocks of Delta Management and Spatial Planning & Design are the same, but not all courses are the same.

Course offer Specialization Spatial Planning & Design:

Semester	Modules	ECTS
3	Vision development (applied in European Deltas) Adaptive Planning for Climate Change (applied in European Deltas)	15 12,5
4	Risk and Disaster Management (applied in Mississippi Delta) Strategic planning for resilient Deltas (applied in the Elbe river basin)	12,5 12,5
7	System analysis & Planning for circularity (applied in Mekong Delta) Coastal Challenge	20 10

Detailed course descriptions as from page 41. The names of the blocks of Delta Management and Spatial Planning & Design are the same, but not all courses are the same.

Optional courses especially for international students

CU34638	Dutch Culture & Languages	2 ECTS
This course will be offered at the Vlissingen Campus.		

Projects of 30 ECTS

You will work on and gain experience in a real project (30 ECTS). Stakeholders and experts from the work field are looking forward to collaborate with you and to find solutions to the challenges they currently encounter. Your contribution will be of direct use to them, and future minor participants will build on your results.

Topics related to our Water management programme are:

- Building with Nature
- Climate Adaption (formerly known as Water Safety & Spatial Planning)
- Water Technology
- Aquaculture

To work on a project an application must be handed in before May 1st (fall semester) or November 1st (spring semester); a limited number of places is available. Students must submit a motivation letter and may be asked to do a Skype interview in order to be selected to join the Research minor.

Courses offered within the Water Management programme – Aquatic Ecotechnology

SEMESTER 3 AET Block 5 Ecological Water Quality & Block 6 Water Treatment

Block 5 / Semester 3						
CU79103V3	**Title: Principles of Data Analysis**	**Number of study credits: 2.5**	**Number of contact hours: 24**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: not applicable.						
Conditions for test participation: not applicable.						
Brief description of course content: Student will learn to prepare data sets for analysis (data management), methods to summarize and describe a data set (descriptive analysis), basic methods to test for statistical significance, to visualise the data in a clear and concise way, and to answer research questions based on data . This course is shared between AET, DM and SPD.						
Learning outcomes: 7.1.2, 6.1						
Compulsory literature: Excel 2007 or higher						
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Resit scheduled in week**
TEST01 (VT)	Written knowledge test	Data analysis skills	100%	5.5	B1.9	B2.10

Block 5 / Semester 3						
CU20590V1	**Title: Concepts of Ecological Water Quality**	**Number of study credits: 5.0**	**Number of contact hours: 44**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: not applicable.						
Conditions for test participation: not applicable.						
Brief description of course content: You will deal with an important water issue: water quality. In this module you also learn how to monitor, analyze causes and effects of changes in water quality. And what the ecological principles (interaction between chemistry and biology) are behind it and how these are related to different water systems like rivers, lakes, estuaries and seas. In this course 'concepts' , you also learn what policy tools, like European Water Framework Directive , are used to access the quality of water bodies and the appropriate measures to be taken.						
Learning outcomes: 1.1 , 1.2, 2.1						
Compulsory literature: *Ecology of Aquatic Systems*, Dobson & Frid, second edition						
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Resit scheduled in week**
TEST01 (VT)	Written knowledge test	Concepts of water quality	100%	5.5	B1.9	B2.10

Block 5 / Semester 3							
CU20591V1	**Title: Applied Ecological Water Quality**	**Number of study credits: 5.0**	**Number of contact hours: 44**	**Mandatory**	**Teaching language: English**		
Conditions for course participation: not applicable.							
Conditions for test participation: complete attendance to PRACEX field week							
Brief description of course content: You will deal with an important water issue: water quality. In this course 'applied' you will apply the knowledge and skills from the other two courses 'concepts' and 'in practice' in specific water systems. Meaning that you will prepare and carry out ecological water quality measurements in the field. Identify the organisms found and analyze physical, chemical and biological data. And based on prevailing policy instruments indicate the quality. Finally, you are asked to evaluate what appropriate measures can be taken to improve the ecological water quality.							
Learning outcomes: 2.2, 3.2, 4.1, 6.1, 7.1, 8.1, 8.2							
Compulsory literature: *Ecology of Aquatic Systems*, Dobson & Frid, second edition							
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**
TEST01 (VT)	Portfolio (individual)	Water quality assessment	100%	5.5	B1.9		B2.10
PRACEX (VT)	Practical exercise	Field week					

Block 5 / Semester 3							
CU20592V1	**Title: Ecological Water Quality in Practice**	**Number of study credits: 2.5**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**		
Conditions for course participation: not applicable							
Conditions for test participation: not applicable							
Brief description of course content: You will deal with an important water issue: water quality. In this course ' in practice', you will learn specific tools to assess the water quality based on the presence of organisms and pigments. Apart from that you learn in an experimental setting how the role of specific organisms like filter feeders, in the food chain can be determined based on the processes measured. And you will work with a computer model, used in water management practice, to analyse causes and feasible measures to improve water quality in lakes.							
Learning outcomes: 6.1, 7.1							
Compulsory literature: Lab kit and lab coat							
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**
TEST01 (VT)	Portfolio (group)	Filter feeders and PC Lake	100%	5.5	B1.7		B1.10

Block 6 / Semester 3					
CU20593v1	**Title: Concepts of water pollution and treatment**	**Number of study credits: 5.0**	**Number of contact hours: 55**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: In this module, you will investigate the possibilities of combatting poor water quality with various treatment techniques. During this module you will learn about the water system and how to monitor its status. You will use calculations to determine the effect of different discharges on a water system and how you can limit these effects through water treatment. Treatment types that will be investigated include biological, chemical and physical.					
Learning outcomes: 1.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test	Water pollution and treatment concepts	100%	5.5	B2.8		B2.10	

Block 6 / Semester 3					
CU20595V1	**Title: Applications of water pollution and treatment**	**Number of study credits: 5.0**	**Number of contact hours: 50**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: participate PRACEX					
Brief description of course content: In the 'Applied' project, you will work on a problem for a local company to help them to try and solve a water quality issue that they have, by producing a design for a treatment technique. You will report your results and final design back to the company at the end of the project.					
Learning outcomes: 2.1, 2.2, 3.2, 4.1, 6.1, 7.1, 8.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Water treatment	100%	5.5	B2.8		B2.10	
PRACEX (VT)	Practical exercise	Participate in lab work and project lessons to obtain skills and info to build portfolio						

Block 6 / Semester 3									
CU20594V1	**Title: Water pollution and treatment in practice**	**Number of study credits: 2.5**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**				
Conditions for course participation: not applicable									
Conditions for test participation: participate PRACEX									
Brief description of course content: During the 'In practice' lab sessions you will learn how to perform water quality analysis of certain essential water quality parameters in the world of water treatment. Besides the lab skills you learn to use balances to analyze a water system. Water and mass balances will be applied to analyze both natural water systems and a waste water treatment system. You also learn to use some analysis tools in GIS.									
Learning outcomes: 6.1, 7.1									
Compulsory literature: not applicable									
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test week**		**Resit scheduled in week**		
TEST 01 (VT)	Portfolio (group)	Water quality analysis	100%	5.5	B2.8		B2.10		
PRACEX (VT)	Practical exercise	Participate in lab work and project lessons to obtain skills and info to build portfolio							

SEMESTER 4 AET Block 7 Hydrology & block 8 Eco Engineering

Block 7 / Semester 4					
CU20611v4	**Title: Concepts of hydrology**	**Number of study credits: 5.0**	**Number of contact hours: 38**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Not applicable					
Conditions for test participation: Not applicable					
Brief description of course content: This course is explaining the theory about concepts of water systems; water in the saturated and unsaturated zone, managing the water levels, small hydraulic structures, wetlands, regional and global issues. You apply the knowledge in calculations.					
Learning outcomes: 1.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week
TEST01 (VT)	Written knowledge test	Concepts of hydrology	70%	5.5	B3.8		B3.10
TEST02 (VT)	Portfolio (individual)	Open channel hydraulics	20%	5.5	B3.3		B3.10
TEST03 (VT)	Portfolio (group)	Hydraulic calculations	10%	5.5	B3.4		B3.10

Block 7 / Semester 4					
CU20616v1	**Title: Applied hydrology**	**Number of study credits: 5.0**	**Number of contact hours: 20**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Not applicable					
Conditions for test participation: Not applicable					
Brief description of course content: In this course the rural problems of water excesses and fresh water shortages in the delta are explored. The course focusses on designing water solutions for stakeholders.					
Learning outcomes: 1.2.1, 2.2.2, 2.2.3, 5.1.1, 8.1, 8.2, 9.1, 9.2.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week
TEST01 (VT)	Portfolio (individual)	Water system analysis	100%	5.5	B3.8		B3.10

Block 7 / Semester 4							
CU20615v1	**Title: Hydrology in practice**	**Number of study credits: 2.5**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**		
Conditions for course participation: Not applicable							
Conditions for test participation: Not applicable							
Brief description of course content: In this course you will learn how to work with a software system: a system to model hydraulic water systems 'Sobek'.							
Learning outcome: 2.1, 3.1							
Compulsory literature: not applicable							
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**
TEST01 (VT)	Assessment (individual)	Conducting a hydraulic water system model	100%	5.5	B3.8		B3.10

Block 8 / Semester 2									
CU20617V4	**Title: Concepts of Eco Engineering**	**Number of study credits: 5.0**	**Number of contact hours: 24**	**Mandatory**	**Teaching language: English**				
Conditions for course participation: not applicable									
Conditions for test participation: not applicable									
Brief description of course content: Eco engineering is the design of sustainable ecosystems that integrate human society with its natural environment for the benefit of both. Threats like loss in biodiversity and habitats, climate change and sea level rise make eco engineering necessary. In this module the focus is on things like building with nature, nature-based solutions and working with nature in delta areas. In concepts you will get insight into coastal protection through measures that are based on natural materials and processes, that also increase the landscape and natural values of the area. The focus is on the interactions and feedback loops between hydrology (waves, tides, currents), morphology (sediment transport, erosion, sedimentation) and ecology (adaptations of species to harsh environments, biodiversity, ecosystem engineers as oysters and mussels).									
Learning outcomes: 1.1, 1.2.2									
Compulsory literature: not applicable									
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**		
TEST01 (VT)	Written knowledge test	Eco Engineering	80%	5.5	B4.8		B4.10		
TEST02 (VT)	Written knowledge test	Ethics	20%	5.5	B4.5		B4.10		

Block 8 / Semester 2									
CU20620V5	**Title: Applied Eco Engineering**	**Number of study credits: 5.0**	**Number of contact hours: 47**		**Mandatory**		**Teaching language: English**		
Conditions for course participation: not applicable									
Conditions for test participation: participate in PRACEX									
Brief description of course content: Eco engineering is the design of sustainable ecosystems that integrate human society with its natural environment for the benefit of both. Threats like loss in biodiversity and habitats, climate change and sea level rise make eco engineering necessary. In this module the focus is on things like building with nature, nature-based solutions and working with nature in delta areas. In *applied* you will produce your own experimental design in a research setting to tackle coastal safety issues and to increase biodiversity in the Dutch delta. You will work in small groups to analyze maps and data and produce innovative ideas for further research.									
Learning outcomes: 1.2.2, 1.3, 2.2.1, 6.1, 7.1.3, 7.1.4, 8.2.1, 9.1.4, 9.2.1									
Compulsory literature: not applicable									
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**		
TEST01 (VT)	Assignment (group)	Proposal future research	30%	5.5	B4.9		B4.10		
TEST02 (VT)	Assignment (group)	Research report of project	60%	5.5	B4.7		B4.10		
TEST03 (VT)	Assignment (individual)	Opiniated essay	10%	5.5	B4.4		B4.7		
PRACEX (VT)	Practical exercise	Attendance at field and lab activities							

Block 8/ Semester 2									
CU20618V1	**Title: Eco Engineering in practice**	**Number of study credits: 2.5**	**Number of contact hours: 24**		**Mandatory**		**Teaching language: English**		
Conditions for course participation: not applicable									
Conditions for test participation: not applicable									
Brief description of course content: Eco engineering is the design of sustainable ecosystems that integrate human society with its natural environment for the benefit of both. Threats like loss in biodiversity and habitats, climate change and sea level rise make eco engineering necessary. In this module the focus is on things like building with nature, nature-based solutions and working with nature in delta areas. You will *practice* with several eco-engineering tools and software. Concepts and how to apply them will be explained for ecotope maps, suitability maps and hypsometric curves. You will apply them in several research cases.									
Learning outcomes: 2.2.2, 2.2.3, 6.1									
Compulsory literature: not applicable									
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**		
TEST01 (VT)	Portfolio (individual)	Eco Engineering tools	100%	5.5	B4.8		B4.10		

SEMESTER 7 AET

Block 13 & 14 / Semester 7					
CU79085V2	**Title: Coastal challenge**	**Number of study credits: 10**	**Number of contact hours: 60**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: In this course, you will develop abilities to work in a multidisciplinary environment. You will work in a group with colleagues from different study programs. The coastal challenge is based on a complex real-life case of a client. It uses the principles of integrated coastal zone management as a framework. You will initiate and design the project and also learn and apply tools for communication, collaboration, management, and innovation.					
Learning outcomes: 1, 2, 3, 7, 8, 9					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Assessment professional development	50%	5.5	B2.7		B2.10	
TEST02 (VT)	Portfolio (group)	End products	50%	5.5	B2.7		B2.10	

Block 13 & 14 / Semester 7					
The course will only be given if at least 8 students subscribe for this elective course					
CU20700v1	**Title: Advanced Water Technology**	**Number of study credits: 10.0**	**Number of contact hours: 90**	**Elective**	**Teaching language: English**

Conditions for course participation:

- Propedeutic exam passed
- At least 120 EC obtained (including provisional credits)
- Internship OR Minor passed
- AET applicants should have completed and passed AET course: Water Pollution and Treatment (CU20593)
- Civil Engineering applicants should have a biology and chemistry profile from high school and should have completed CE course: Sanitary Engineering (CU23880) with a pass grade of 7.5 or higher.

Conditions for test participation: not applicable

Brief description of course content:

This course will build on the students' existing basic knowledge of wastewater treatment theory and technologies used. During this course the student will learn to determine what water quality measurements are needed for a specific water source and desired water product and they will be able to set up a water treatment scheme to treat the water from quality A (source) to quality B (product). Once they have set up a theoretical treatment scheme, they will also learn how to calculate the water balance, water recovery and how to monitor the system on main performance parameters, including statistical analysis and optimisation.

Learning outcomes: 1.1, 2.1, 2.2, 3.1, 6.1, 9.1

Compulsory literature: not applicable

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Concepts of Advanced Water Technology	25%	5.5	B1.4 – B1.9		B2.3	
TEST02 (VT)	Portfolio (individual)	Creating a water treatment train	50%	5.5	B2.5 – B2.7		B2.10	
TEST03 (VT)	Portfolio (group)	Flow operation in a water treatment proces	25%	5.5	B1.2 – B2.2		B2.10	

Block 13 & 14 / Semester 7					
The course will only be given if at least 8 students subscribe for this elective course					
CU79044v1	**Title: Ecological Risk Assessment**	**Number of study credits: 10**	**Number of contact hours: 70**	**Elective**	**Teaching language: English**

Conditions for course participation:

- Propaedeutic exam passed
- At least 120 EC obtained (including provisionary credits)
- Internship OR Minor passed

Conditions for test participation: To be allowed to participate in TEST04 (VT) approval of the preparatory literature review is required

Brief description of course content:

During the course, you will make an ecological risk assessment on a project that is being carried out or planned and can have an environmental impact. Examples of these projects are dumping of polluted dredging sludge or the use of LD steel slag as substrate for dikes. For this, practical laboratory skills and theoretical knowledge about ecotoxicology is necessary in order to analyse and predict adverse effects of pollution on the aquatic environment. Effects will be studied at different levels, in particular from the level of molecules to the level of ecosystems. In order to come up with a well-founded conclusion on ecotoxicological effects, you need knowledge on the behaviour of chemical substances in the abiotic and biotic environment. The biotic environment can be studied at the level of the cell, tissue, organism, population, community or ecosystem. In several practicals you will learn how to use and apply eco-toxicological tests.

You will learn what guiding principles are in environmental policy on different levels (UN, EU, national, regional) and what legal policy instruments are, which are used in practise. For the legal instrument environmental impact assessment (EIA) you will go through the whole procedure of an impact assessment, in different roles by means of a case study. In such a way you learn the pro's and con's of EIA.

Learning outcomes: 1.1, 1.2, 3.1, 4.1, 6.1, 7.1, 8.1, 8.2, 9.1, 9.2

Compulsory literature: *Ecotoxicology Essentials Environmental Contaminants and Their Biological Effects on Animals and Plants*, 1st Edition - April 15, 2016

- Author: Donald Sparling
- Paperback ISBN: 9780128019474
- eBook ISBN: 9780128019610

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test	Concepts of Ecotoxicology	30%	5.5	B1.9		B2.10	
TEST02 (VT)	Portfolio (group)	Practical Ecotoxicology	25%	5.5	B2.7		B2.9	
TEST03 (VT)	Assignment (individual)	Environmental Impact Assessment	30%	5.5	B2.7		B2.10	
TEST04 (VT)	Presentation (group)	Poster Ecological Risks	15%	5.5	B1.7		B1.9	

Block 13 & 14 / Semester 7					
The course will be given only if at least 8 students subscribe to this elective course					
CU79043V1	**Title: Aquaculture**	**Number of study credits:10**	**Number of contact hours:88**	**Elective**	**Teaching language: English**

Conditions for course participation:

- Propaedeutic exam passed
- At least 120 EC obtained (including provisionary credits)
- Internship or minor passed
- Excursions: participation is mandatory

Conditions for test participation: Not applicable

Brief description of course content:

This introductory course to aquaculture is an elective course, in which the focus will primarily be on the cultivation of saltwater organisms and the setup of an aquaculture business case. Shellfish, fish, and various low trophic species are increasingly cultivated under controlled circumstances. During the course, a large proportion of input will be provided by experts in the sector (through guest lectures and excursions) and various case studies. As a result, you will get a good impression of various aspects of ((inter)national) aquaculture.

You will learn about the biology of the organisms, the technical aspects of culturing (reproduction), the cultivation systems, the sustainability of aquaculture, the legislation, animal welfare, health management and economic aspects. In addition, you will get a taste of cost-price calculations, how to make a financial business plan, and how to bring your chosen product to the market.

Learning outcomes: 1.1, 1.2, 1.3,2.1, 2.2,3.1, 3.2, 5.1, 7.1 8.1, 8.2, 9.1

Compulsory literature: not applicable

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test	Concepts of Aquaculture	25%	5.5	B2.8		B2.10	
TEST02 (VT)	Assignment (group)	Paper: an aquaculture business plan	40%	5.5	B2.9		B2.10	
TEST03 (VT)	Assignment (group)	Paper about a case study	25%	5.5	B2.3		B2.9	
TEST04 (VT)	Presentation (group)	Poster about aquaculture practices	10%	5.5	B2.5		B2.9	

Block 13 & 14 / Semester 7					
CU79087V1	**Title: Urban Water Management**	**Number of study credits: 10**	**Number of contact hours: 70**	**Elective**	**Teaching language: English**

Conditions for course participation:

- The course will only be given if at least 10 students register for this elective course.
- Propedeutic phase passed.
- For the 4-year track: at least 60 ECs obtained in the major phase.
- For the 3-year track: at least 30 ECs obtained in the major phase.
- Minor or internship passed.

Conditions for test participation: not applicable

Brief description of course content: Sewer systems are critical infrastructures from technical, environmental and management viewpoints. The course takes advantage of this scenario to develop several cross-discipline and transferable skills. About 60% of the course focuses on sewer systems design, from the calculation of wastewater and rainwater input to the sizing of the ducts and the pumping stations. This requires applying the theory proactively and tailoring the solution to the particular case study, as the design cannot rely on comprehensive manuals such as the Eurocode. Proper design, construction and functioning of sewer systems are crucial in order to avoid pollution of soil and water. The remaining 40% of the course deals with management and maintenance, which is complicated due to the infrastructure being underground and prone to deteriorating. You will learn how to apply Asset Management skills, from the underlying way of thinking to technical in-depth knowledge on how to recover aging infrastructures. The best Engineers have knowledge about all aspects of the complete life cycle of infrastructure. This course has been developed in cooperation with the asset management research group of HZ and external experts from the professional field.

Learning outcomes: 1.1, 1.3, 2.1, 2.2, 3.1, 4.1, 5.1, 7.2, 8.1, 8.2, 9.2

Compulsory literature: not applicable

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (group)	Sewer systems design	30%	5.5	B1.9		B1.10	
TEST02 (VT)	Portfolio (group)	Asset management	30%	5.5	B2.8		B2.10	
TEST03 (VT)	Written knowledge test		40%	5.5	B2.8		B2.10	

SEMESTER 3 DM Block 5 Vision Development & Block 6 Adaptive Planning for Climate Change

Block 5 / Semester 3							
CU79103V3	**Title: Principles of Data Analysis**	**Number of study credits: 2.5**	**Number of contact hours: 24**	**Mandatory**	**Teaching language: English**		
Conditions for course participation: not applicable.							
Conditions for test participation: not applicable.							
Brief description of course content: Student will learn to prepare data sets for analysis (data management), methods to summarize and describe a data set (descriptive analysis), basic methods to test for statistical significance, to visualise the data in a clear and concise way, and to answer research questions based on data . This course is shared between AET, DM and SPD.							
Learning outcomes: 7.1.2, 6.1.2							
Compulsory literature: Excel 2007 or higher							
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**
TEST01 (VT)	Written knowledge test	Data analysis skills	100%	5.5	B1.9		B2.10

Block 5 / Semester 3								
CU79025v1	**Title: Vision development theory**	**Number of study credits: 3.0**	**Number of contact hours: 26**	**Mandatory**	**Teaching language: English**			
Conditions for course participation: Not applicable								
Conditions for test participation: Not applicable								
Brief description of course content: This course covers theories about vision development. You will learn how to formulate a vision by using scenarios based on different uncertainties and driving forces. Furthermore, you learn about the management of these processes (embedded within the Environmental and Development Act), stakeholder participation and communication with different target groups.								
Learning outcomes: 1.1.3								
Compulsory literature: not applicable								
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**	
TEST01 (VT)	Written knowledge test	Vision development theories	100%	5.5	B1.9		B2.10	

Block 5 / Semester 3						
CU79055v3	**Title: Climate change physics & effects**	**Number of study credits: 2.5**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: Not applicable						
Conditions for test participation: Not applicable						
Brief description of course content: This course covers the theories about the climate change physics and effects. You will learn the basic physics and calculations behind the climate change effects (drought, heat stress, floods and extreme precipitation) in Europe and their social and economic impact. Complementary to the aforementioned content you will learn and practice basic hydrology calculations.						
Learning outcomes: 9.2.1.						
Compulsory literature: climate change physics & effects reader						

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test	Climate change physics	100%	5.5	B1.9		B2.10	

Block 5 / Semester 3						
CU79028v3	**Title: Advanced GIS**	**Number of study credits: 2.0**	**Number of contact hours: 18**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: Not applicable						
Conditions for test participation: Not applicable						
Brief description of course content: In this course is the follow up of the 'introduction into GIS course'. You will learn how to conduct a raster, vector and a DEM analysis, with the uses ARC GIS Pro software. By realizing a flood impact analysis of a flood prone area. Course will be assessed by a portfolio test in week 7 of semester 1.						
Learning outcomes: 1.1.1, 6.1.1						
Compulsory literature: ARC GIS Pro, running under HZ licence at MacOS or Microsoft Windows, and the use of a non-desktop computer is required.						

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Arc GIS Pro	100%	5.5	B1.7		B1.10	

Block 5 / Semester 3					
CU79107V2	**Title: Climate Proof Area Vision**	**Number of study credits: 5.0**	**Number of contact hours: 44**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Not applicable					
Conditions for test participation: not applicable					
Brief description of course content: In this project you will develop a vision for an European flood prone region. This policy document will be based on area analysis, desk research and scenarios. The course will be assessed on behalf of a report of your vision performed on the basis of the research circle, a digital presentation of your vision as group product and a supporting water balance.					
Learning outcomes: 1.1.1, 1.1.3, 1.2.1, 2.1, 2.2.3, 7.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Assignment (group)	Area vision	30%	5.5	B1.7		B1.10	
TEST02 (VT)	Presentation (group)	Area vision	40%	5.5	B1.9		B2.02	
TEST03 (VT)	Portfolio (individual)	Water balance	30%	5.5	B1.4- B1.7		B1.10	

Block 6 / Semester 3					
CU79030v1	**Title: Adaptive Planning Theory**	**Number of study credits: 3.0**	**Number of contact hours: 26**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Not applicable					
Conditions for test participation: Not applicable					
Brief description of course content: This course covers theories for planning and management for adaptation and mitigation. This will be explained via the application in the Dutch Delta program, taking into consideration the different socio-economic and cultural dimensions and the European context. This course prepares for the adaptive Climate Change Tender.					
Learning outcomes:2.1.1, 2.1.2, 4.1.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test	Concepts of planning and management for adaptation and mitigation	100%	5.5	B2.8		B2.10	

Block 6 / Semester 3						
CU79105V1	**Title: Research Methodology**	**Number of study credits: 2.0**	**Number of contact hours: 18**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: Not applicable						
Conditions for test participation: Not applicable						
Brief description of course content: This course covers the steps of the research cycle from the research proposal till writing your report. The report will be assessed with an assessment form and a peer assessment of your individual contribution to the group work.						
Learning outcomes: 7.1.2, 7.1.3, 7.1.4						
Compulsory literature:						

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Assignment (group)	Paper	100%	5.5	B2.7		B2.10	

Block 6 / Semester 3						
CU79033v4	**Title: Data Visualisation**	**Number of study credits: 2.5**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: Not applicable						
Conditions for test participation: Not applicable						
Brief description of course content: In this course you will learn how to visualize data in a professional way. You will learn how to upgrade GIS maps into professional visuals by the use of Adobe Illustrator and display them in the digital environment of ArcGis storymaps . The course will be assessed by an digital portfolio						
Learning outcomes:6.1.2, 8.1.1						
Compulsory literature: For this course is ArcGIS Pro and Adobe Illustrator, running at macOS or Microsoft Windows, and the use of a non-desktop computer required.						

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Arc GIS storymap	50%	5.5	B2.8		B2.10	
TEST02 (VT)	Portfolio (individual)	Adobe illustrator	50%	5.5	B2.8		B2.10	

Block 6 / Semester 3					
CU79106V1	**Title: Climate Adaptive area request for proposal**	**Number of study credits: 5.0**	**Number of contact hours: 36**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Not applicable					
Conditions for test participation: Not applicable					
Brief description of course content: In this project you will enrol as team (your group) for a 'climate adaptive area request for proposal'. This request for proposal will be based on area analysis, desk research and theories for planning and management for adaptation and mitigation. The vision will be displayed in an request for proposal, a group product, which is supported by a calculated water system design. The request for proposal of the vision will be presented as a group product, assessed by the lecturers according to the completion criteria and individual oral examination.					
Learning outcomes: 2.2.1, 3.1.1, 3.2.1, 5.1.1, 6.1.1, 8.1.1, 8.2, 9.2.2					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Assignment (group)	Request for proposal	30%	5.5	B2.7		B2.10	
TEST02 (VT)	Presentation (individual)	Request for proposal	40%	5.5	B2.8		B2.10	
TEST03 (VT)	Portfolio (individual)	Water system design	30%	5.5	B2.2 - B2.5		B2.10	

SEMESTER 4 DM Block 7 Risk and Disaster Management & Block 8 Strategic Planning for Resilient Deltas

Block 7 / Semester 4					
CU79035v1	**Title: Spatial Planning for Deltaic Risks**	**Number of study credits: 3**	**Number of contact hours:22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: Within this module you will focus on vulnerabilities and risks present in delta areas in general and the Mississippi delta, USA specifically. You will learn which environmental, ecological, spatial and climate risks are present and how they relate to each other and to the social-economic and institutional risks. Furthermore, you will learn theories about planning for risks and disaster management.					
Learning outcomes: 1.1.1, 1.1.3, 1.2.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test		100%	5.5	B3.8		B3.10	

Block 7 / Semester 4					
CU79036v1	**Title: Social and Economic Risks**	**Number of study credits: 3**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: Within this module you will learn about economic and social risks of climate change in particular for delta areas. You will learn about the economic and social risks of climate change. You will learn theories about disaster economics, economic value of ecosystem services and you will also get an introduction in systems thinking. You will learn to look at these topics from different perspectives and apply your knowledge on cases, in particular the case of the Mississippi delta in Louisiana, USA.					
Learning outcomes: 1.1.1, 1.1.3, 1.2.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test	Social and economic risks of climate change and disasters	100%	5.5	B3.8		B3.10	

Block 7 / Semester 4					
CU79037v1	**Title: Project & Process I**	**Number of study credits: 3**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: Within this module you will learn about risk analysis of delta areas. We will focus on the case of the Mississippi delta in Louisiana, USA. You will learn which social and institutional risks are present within deltas. You will learn relevant theories about project and process management, design, actor- and stakeholder analysis and governance.					
Learning outcomes: 1.1.1, 1.1.3, 1.2.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test	Project and process risks	100%	5.5	B3.8		B3.10	

Block 7 / Semester 4					
CU79038v1	**Title: Integrated Risk Assessment for Delta Areas**	**Number of study credits: 3.5**	**Number of contact hours:30**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: In this project you will execute a risk assessment of a certain area in the Mississippi delta. You will apply theories of risk and disaster management, ecosystem services, spatial analysis, process management and design, actor- and stakeholder analysis, governance, spatial economics and disaster economics. You will apply this knowledge in a group project. In this project you have to apply the statistics, GIS and visualization skills you have obtained in previous modules and will further develop in this module. You will also reflect on your performance and development within a group and will be assessed on this.					
Learning outcomes: 1.1, 1.2.1, 2.2.3, 7.1.2, 8.1.1, 8.2.1, 8.2.2, 9.1.1, 9.1.2, 9.1.3					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Assignment (group)	Integrated risk assessment	75%	5.5	B3.7		B3.10	
TEST02 (VT)	Criterion-referenced interview (individual)	Performance in group work	25%	5.5	B3.8		B3.10	

Block 8 / Semester 4					
CU79097v1	**Title: Spatial Planning for Resilience**	**Number of study credits: 2**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: Within this course you will learn theories on resilience building, the different types of resilience (spatial, technical, ecological, etc.), levels of resilience as well as design qualities contributing to resilience. Next to that, spatial planning in the US context and strategy development for resilient deltas will be further explored.					
Learn outcomes: 1.2.2, 1.3					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)		100%	5.5	B4.8		B4.10	

Block 8 / Semester 4					
CU79098v1	**Title: Socioeconomic Resilience**	**Number of study credits: 2**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: Within this course you will learn about strategic planning for resilient deltas. We will focus on the case of the Mississippi delta in Louisiana, USA. You will learn theories on concepts of socioeconomic resilience, strategy development, economic thinking and systems thinking, and social cost and benefit analysis. You will have to apply your knowledge in the project and in a portfolio with a practical assignment/ small research.					
Learning outcomes: 1.1.2, 1.2.2, 2.1.1, 3.1.1, 9.2					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Socioeconomic resilience	100%	5.5	B4.8		B4.10	

Block 8 / Semester 4					
CU79100v1	**Title: Project & Process II**	**Number of study credits: 2**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: Within this module you will learn about risk analysis of delta areas. We will focus on the case of the Mississippi delta in Louisiana, USA. You will learn which social and institutional risks are present within deltas. You will learn to apply theories, project and process management and strategic stakeholder management in projects.					
Learning outcomes: 1.3, 3.1.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Process management	100%	5.5	B4.8		B4.10	

Block 8 / Semester 4					
CU79099v1	**Title: Strategic Planning for Resilient Deltas**	**Number of study credits: 6.5**	**Number of contact hours: 66**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: Within this module you will learn about strategic planning for resilient deltas. We will focus on a case within the Mississippi delta in Louisiana, USA. You will learn to apply theories on resilience, spatial planning in the US context, strategy development, economic thinking and system thinking, project/process management and social cost and benefit analysis. You will apply this knowledge within an individual project where you work on a proposal for a competition to make a New Orleans more resilient. You will apply your visualisation, GIS and statistics skills in the project. You will develop your presentation skills to give a pitch for the proposal.					
Learning outcomes: 1.2.2, 1.3, 2.1, 2.2, 3.1, 3.2, 4.1, 5.1, 6.1.1, 7.1.2, 8.1, 8.2.3					
Compulsory literature: not applicable					

Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**	
TEST01 (VT)	Assignment (individual)	Resilience proposal	75%	5.5	B4.7		B4.10	
TEST02 (VT)	Presentation (individual)	Pitch resilience proposal	25%	5.5	B4.8		B4.10	

SEMESTER 7 DM

Block 13 & 14 / Semester 7					
CU79085V2	**Title: Coastal challenge**	**Number of study credits: 10**	**Number of contact hours: 60**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: In this course, you will develop abilities to work in a multidisciplinary environment. You will work in a group with colleagues from different study programs. The coastal challenge is based on a complex real-life case of a client. It uses the principles of integrated coastal zone management as a framework. You will initiate and design the project and learn and apply tools for communication, collaboration, management, and innovation.					
Learning outcomes: 1, 2, 3, 7, 8, 9					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Assessment professional development	50%	5.5	B2.7		B2.10	
TEST02 (VT)	Portfolio (group)	End products	50%	5.5	B2.7		B2.10	

Block 13 / Semester 7								
CU79109v1	**Title: Mekong delta-Integrated area and system analysis**	**Number of study credits: 10**	**Number of contact hours: -**		**Mandatory**		**Teaching language: English**	
Conditions for course participation: not applicable								
Conditions for test participation: not applicable								
Brief description of course content: In this course an integrated area and (water) system analysis of an area in the Vietnamese Mekong Delta will be conducted. The outcome of this analysis will be used to develop relevant scenarios for a more circular development of this delta.								
Learning outcomes: 1.1, 1.2, 1.3, 2.1, 7.1, 8.2								
Compulsory literature: not applicable								
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**	
TEST01 (VT)	Portfolio (Individual)	Analysis and scenario's	100%	5.5	B1.9		B2.2	

Block 14 / Semester 7								
CU79110v1	**Title: Planning for circularity-Mekong delta**	**Number of study credits: 10**	**Number of contact hours: -**		**Mandatory**		**Teaching language: English**	
Conditions for course participation: not applicable								
Conditions for test participation: not applicable								
Brief description of course content: In this course a circular project needs to be developed for an area in the Vietnamese Mekong delta, based on the system analysis in module 13. Your solution should fit within the Vietnamese/Mekong delta policies and culture. You will also learn to specify feasibility, practicability and sustainability, social costs and benefits and funding options.								
Learning outcomes: 2.1, 2.2, 3.1, 3.2, 4.1, 5.1, 6.1, 8.1, 8.2, 9.1								
Compulsory literature: not applicable								
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**	
TEST01 (VT)	Portfolio	International tender and assignments	50%	5.5	B2.7		B2.10	
TEST02 (VT)	Criterion referenced interview		50%	5.5	B2.8		B2.10	

Courses offered within the Water Management programme – Spatial Planning & Design

SEMESTER 3 SPD Block 5 Vision Development & Block 6 Adaptive Planning for Climate Change

Block 5 / Semester 3							
CU79103V3	**Title: Principles of Data Analysis**	**Number of study credits: 2.5**	**Number of contact hours: 24**	**Mandatory**	**Teaching language: English**		
Conditions for course participation: not applicable.							
Conditions for test participation: not applicable.							
Brief description of course content: Student will learn to prepare data sets for analysis (data management), methods to summarize and describe a data set (descriptive analysis), basic methods to test for statistical significance, to visualise the data in a clear and concise way, and to answer research questions based on data . This course is shared between AET, DM and SPD.							
Learning outcomes: 7.1.2, 6.1.2							
Compulsory literature: Excel 2007 or higher							
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**
TEST01 (VT)	Written knowledge test	Data analysis skills	100%	5.5	B1.9		B2.10

Block 5 / Semester 3								
CU79025v1	**Title: Vision development theory**	**Number of study credits: 3.0**	**Number of contact hours: 26**	**Mandatory**	**Teaching language: English**			
Conditions for course participation: Not applicable								
Conditions for test participation: Not applicable								
Brief description of course content: This course covers theories about vision development. You will learn how to formulate a vision by using scenarios based on different uncertainties and driving forces. Furthermore, you learn about the management of these processes (embedded within the Environmental and Development Act), stakeholder participation and communication with different target groups.								
Learning outcomes: 1.1.3								
Compulsory literature: not applicable								
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**	
TEST01 (VT)	Written knowledge test	Vision development theories	100%	5.5	B1.9		B2.10	

Block 5 / Semester 3						
CU79055v3	**Title: Climate change physics & effects**	**Number of study credits: 2.5**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: Not applicable						
Conditions for test participation: Not applicable						
Brief description of course content: This course covers the theories about the climate change physics and effects. You will learn the basic physics and calculations behind the climate change effects (drought, heat stress, floods and extreme precipitation) in Europe and their social and economic impact. Complementary to the aforementioned content you will learn and practice basic hydrology calculations.						
Learning outcomes: 9.2.1.						
Compulsory literature: climate change physics & effects reader						

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test	Climate change physics	100%	5.5	B1.9		B2.10	

Block 5 / Semester 3						
CU79028v3	**Title: Advanced GIS**	**Number of study credits: 2.0**	**Number of contact hours: 18**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: Not applicable						
Conditions for test participation: Not applicable						
Brief description of course content: In this course is the follow up of the 'introduction into GIS course'. You will learn how to conduct a raster, vector and a DEM analysis, with the uses ARC GIS Pro software. By realizing a flood impact analysis of a flood prone area. Course will be assessed by a portfolio test in week 7 of semester 1.						
Learning outcomes: 1.1.1, 6.1.1						
Compulsory literature: ARC GIS Pro, running under HZ licence at MacOS or Microsoft Windows, and the use of a non-desktop computer is required.						

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Arc GIS Pro	100%	5.5	B1.7		B1.10	

Block 5 / Semester 3					
CU79104V2	**Title: Climate Proof Spatial Vision**	**Number of study credits: 5.0**	**Number of contact hours: 44**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Not applicable					
Conditions for test participation: not applicable					
Brief description of course content: In this project you will develop as a design team a vision for an urbanized European flood prone region. This distinctive vision will be based on site visit, area analysis, desk research and spatial scenarios. The vision will be developed by the use of a multilayer based approach. The maps will be elaborated by use of GIS, visualization. The vision will be displayed in a paper, a group product, and underpinned by the knowledge of the courses of the previous modules. The course will be assessed on behalf of a paper of your vision performed on the basis on research, a digital presentation of your vision as group product and a supporting water balance.					
Learning outcomes: 1.1.1, 1.1.3, 1.2.1, 2.1, 2.2.3,7.1.					
Compulsory literature:					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Paper Assignment (group)	Spatial area vision	30%	5.5	B1.7		B1.10	
TEST02 (VT)	Presentation (group)	Spatial area vision	40%	5.5	B1.9		B2.02	
TEST03 (VT)	Portfolio (individual)	Water balance	30%	5.5	B1.4- B1.7		B1.10	

Block 6 / Semester 3					
CU79030v1	**Title: Adaptive Planning Theory**	**Number of study credits: 3.0**	**Number of contact hours: 26**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Not applicable					
Conditions for test participation: Not applicable					
Brief description of course content: This course covers theories for planning and management for adaptation and mitigation. This will be explained via the application in the Dutch Delta program, taking into consideration the different socio-economic and cultural dimensions and the European context. This course prepares for the adaptive Climate Change Tender.					
Learning outcomes:2.1.1, 2.1.2, 4.1.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test	Concepts of planning and management for adaptation and mitigation	100%	5.5	B2.8		B2.10	

Block 6 / Semester 3					
CU79105V1	**Title: Research Methodology**	**Number of study credits: 2.0**	**Number of contact hours: 18**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Not applicable					
Conditions for test participation: Not applicable					
Brief description of course content: This course covers the steps of the research cycle from the research proposal till writing your report. The report will be assessed with an assessment form and a peer assessment of your individual contribution to the group work.					
Learning outcomes: 7.1.2, 7.1.3, 7.1.4					
Compulsory literature:					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Assignment (group)	Paper	100%	5.5	B2.7		B2.10	

Block 6 / Semester 3					
CU79033v4	**Title: Data Visualisation**	**Number of study credits: 2.5**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Not applicable					
Conditions for test participation: Not applicable					
Brief description of course content: In this course you will learn how to visualize data in a professional way. You will learn how to upgrade GIS maps into professional visuals by the use of Adobe Illustrator and display them in the digital environment of ArcGis storymaps . The course will be assessed by an digital portfolio					
Learning outcomes:6.1.2, 8.1.1					
Compulsory literature: For this course is ArcGIS Pro and Adobe Illustrator, running at macOS or Microsoft Windows, and the use of a non-desktop computer required.					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Arc GIS storymap	50%	5.5	B2.8		B2.10	
TEST02 (VT)	Portfolio (individual)	Adobe illustrator	50%	5.5	B2.8		B2.10	

Block 6 / Semester 3					
CU79108V1	**Title: Strategic spatial interventions**	**Number of study credits: 5.0**	**Number of contact hours: 36**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Not applicable					
Conditions for test participation: not applicable					
Brief description of course content: In this project you will individually elaborate your vision for an urbanized European flood prone region. You will elaborate your intervention within the framework of your Climate Proof Spatial Vision into an integrated spatial proposal with impact on different themes and scale levels. The interventions shows how the area will be more climate adaptive and biodiverse in combination with relevant spatial challenges. The vision will be displayed in a design, an individual product, which is underpinned by the knowledge of the previous courses.					
Learning outcomes: 2.2.1, 3.1.1, 3.2.1, 5.1.1, 6.1.1, 8.1.1, 8.2, 9.2.2					
Compulsory literature:					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Presentation (individual)	Spatial intervention design	70%	5.5	B2.8		B2.10	
TEST02 (VT)	Portfolio (individual)	Spatial intervention design	30%	5.5	B2.2 – B2.5		B2.10	

SEMESTER 4 SPD Block 7 Risk and Disaster Management & Block 8 Strategic Planning for Resilient Deltas

Block 7 / Semester 4					
CU79035v1	**Title: Spatial Planning for Deltaic Risks**	**Number of study credits: 3**	**Number of contact hours:22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: Within this module you will focus on vulnerabilities and risks present in delta areas in general and the Mississippi delta, USA specifically. You will learn which environmental, ecological, spatial and climate risks are present and how they relate to each other and to the social-economic and institutional risks. Furthermore, you will learn theories about planning for risks and disaster management.					
Learning outcomes: 1.1.1, 1.1.3, 1.2.1					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test		100%	5.5	B3.8		B3.10	

Block 7 / Semester 4					
CU79095v1	**Title: Social Systems Risks**	**Number of study credits: 3**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: Within this course you will learn the basics about economic and socioeconomic risks in delta areas. You will learn about the economic and social risks of climate change. You will learn to identify process related risks that have impact on the feasibility of your project in the Mississippi delta.					
Learning outcomes: 1.1.1, 1.1.3, 1.2.1					
Compulsory literature: literature in the form of articles, policy documents and book chapters will be handed out during the lectures					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Written knowledge test	Social, economic and process risks of climate change and disasters	100%	5.5	B3.8		B3.10	

Block 7 / Semester 4					
CU79096v1	**Title: Design Methodologies I**	**Number of study credits: 3**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: In this course you will explore a variety of design methodologies and you will learn for what design assignments you can apply the different methodologies. During the lessons we will explain the pros and cons of diverse design methodologies. You will practice the different methodologies and will be assessed with a portfolio, in which you demonstrate your ability to apply the different methodologies.					
Learning outcomes: 7.1.1, 7.1.3					
Compulsory literature: literature in the form of articles, policy documents and book chapters will be handed out during the lectures					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)	Proof of competence and skills	100%	5.5	B3.8		B3.10	

Block 7 / Semester 4					
CU79038v1	**Title: Integrated Risk Assessment for Delta Areas**	**Number of study credits: 3.5**	**Number of contact hours:30**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: In this project you will execute a risk assessment of a certain area in the Mississippi delta. You will apply theories of risk and disaster management, ecosystem services, spatial analysis, process management and design, actor- and stakeholder analysis, governance, spatial economics and disaster economics. You will apply this knowledge in a group project. In this project you have to apply the statistics, GIS and visualization skills you have obtained in previous modules and will further develop in this module. You will also reflect on your performance and development within a group and will be assessed on this.					
Learning outcomes: 1.1, 1.2.1, 2.2.3, 7.1.2, 8.1.1, 8.2.1, 8.2.2, 9.1.1, 9.1.2, 9.1.3					
Compulsory literature: literature in the form of articles, policy documents and book chapters will be handed out during the lectures					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Assignment (group)	Integrated risk assessment	75%	5.5	B3.7		B3.10	
TEST02 (VT)	Criterion-referenced interview (individual)	Performance in group work	25%	5.5	B3.8		B3.10	

Block 8 / Semester 4					
CU79097v1	**Title: Spatial Planning for Resilience**	**Number of study credits: 2**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: Within this course you will learn theories on resilience building, the different types of resilience (spatial, technical, ecological, etc.), levels of resilience as well as design qualities contributing to resilience. Next to that, spatial planning in the US context and strategy development for resilient deltas will be further explored.					
Learn outcomes: 1.2.2, 1.3.1, 1.3.2					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)		100%	5.5	B4.8		B4.10	

Block 8 / Semester 4					
CU79102v1	**Title: Design Methodologies II**	**Number of study credits: 3**	**Number of contact hours: 22**	**Mandatory**	**Teaching language: English**
Conditions for course participation: not applicable					
Conditions for test participation: not applicable					
Brief description of course content: This course is an elaboration of the previous methodology course, in which you have explored different design methodologies. In this course we will analyze the variety of methodology in depth. You will learn how scales of interventions and the phase in which the design is affect which methodology is the most suitable. You will practice with designing your own methodology. This course will be assessed with a portfolio.					
Learning outcomes: 7.1.4					
Compulsory literature: not applicable					

Test code	Assessment type	Content	Weighting Factor (%)	Minimum score	Planning test in week		Resit scheduled in week	
TEST01 (VT)	Portfolio (individual)		100%	5.5	B4.8		B4.10	

Block 8 / Semester 4								
CU79101V1	**Title: Integrated Spatial Water Plan**	**Number of study credits: 7.5**	**Number of contact hours: 30**		**Mandatory**		**Teaching language: English**	
Conditions for course participation: not applicable								
Conditions for test participation: not applicable								
Brief description of course content: With a (strategic) spatial plan for an urbanized delta region, you propose concrete water-related design solutions as part of an integrated approach for resilient, liveable and attractive delta regions in the future.								
Learning outcomes: 1.1.3, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 4.1, 8.1, 8.2, 9.2								
Compulsory literature: not applicable								
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**	
TEST01 (VT)	Assignment (individual)	Paper	75%	5.5	B4.7		B4.10	
TEST02 (VT)	Presentation (individual)	Explanation and reflection on spatial water plan	25%	5.5	B4.8		B4.10	

SEMESTER 7 SPD

Block 13 & 14 / Semester 7									
CU79085V2	**Title: Coastal challenge**	**Number of study credits: 10**	**Number of contact hours: 60**	**Mandatory**	**Teaching language: English**				
Conditions for course participation: not applicable									
Conditions for test participation: not applicable									
Brief description of course content: In this course, you will develop abilities to work in a multidisciplinary environment. You will work in a group with colleagues from different study programs. The coastal challenge is based on a complex real-life case of a client. It uses the principles of integrated coastal zone management as a framework. You will initiate and design the project and also learn and apply tools for communication, collaboration, management, and innovation.									
Learning outcomes: 1, 2, 3, 7, 8, 9									
Compulsory literature: not applicable									
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**		
TEST01 (VT)	Portfolio (individual)	Assessment professional development	50%	5.5	B2.7		B2.10		
TEST02 (VT)	Portfolio (group)	End products	50%	5.5	B2.7		B2.10		

Block 13 / Semester 7									
CU79111v1	**Title: Mekong delta-Integrated spatial and system analysis**	**Number of study credits: 10**	**Number of contact hours: -**	**Mandatory**	**Teaching language: English**				
Conditions for course participation: not applicable									
Conditions for test participation: not applicable									
Brief description of course content: You will analyse a specific region in the delta and develop relevant scenarios**.** The analysis and the scenario's will be used to design a water plan to make a regenerative landscape.									
Learning outcomes: 1.1, 1.2, 1.3, 2.1, 7.1, 8.2									
Compulsory literature: not applicable									
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**		
TEST01 (VT)	Portfolio	Analysis and spatial scenarios	100%	5.5	B1.9		B2.2		

Block 14 / Semester 7								
CU79112v1	**Title: Designing for circularity-Mekong delta**	**Number of study credits: 10**	**Number of contact hours: -**		**Mandatory**		**Teaching language: English**	
Conditions for course participation: not applicable								
Conditions for test participation: not applicable								
Brief description of course content: You will design a water plan to make a regenerative landscape.								
Learning outcomes: 2.1, 2.2, 3.1, 3.2, 4.1, 5.1, 6.1, 8.1, 8.2, 9.1								
Compulsory literature: not applicable								
Test code	**Assessment type**	**Content**	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**		**Resit scheduled in week**	
TEST01 (VT)	Portfolio	International tender and assignments	50%	5.5	B2.7		B2.10	
TEST02 (VT)	Criterion referenced interview		50%	5.5	B2.8		B2.10	