

Degree Programme Regulations 2023/24

The programme of study is as defined below:

In semester 1 of year 1, candidates take a total of 30 ECTS credits consisting of the following compulsory modules to value 6 ECTS credits,

Code	ECTS Credits	Se m	Comp /Opt	Institution	Descriptive title
EU-AQ-1.5-C (BTU) EM1AUE05 (UNS) UPC - 29864 (UPC)	4	1	C	UNS/BTU/UPC	Web-based collaborative engineering
EU-AQ-1.5-C (BTU) EM1AUE06 (UNS) UPC - 29862-1 (UPC)	2	1	C	UNS/BTU/UPC	European Language I skills (French/German/Spanish)

and compulsory modules to the value of 24ECTS credits at any one selected institution as follows;

Code	ECTS Credit s	Se m	Comp /Opt	Institution	Descriptive title
EM1AUE01	6	1	C	UNS	Mathematics and Physics
EM1AUE02	6	1	C	UNS	Hydrology and Hydraulics
EM1AUE03	6	1	C	UNS	Intro to Water and Aquatic Environment Management
EM1AUE04	6	1	C	UNS	Computer Skills, Databases & GIS-ICT
EU-AQ-1.1-C	6	1	C	BTU	Mathematics and Physics
EU-AQ-1.2-C	6	1	C	BTU	Hydrology and Hydraulics
EU-AQ-1.3-C	6	1	C	BTU	Intro to Water and Aquatic Environment Management
EU-AQ-1.4-C	6	1	C	BTU	Computer Skills, Databases & GIS-ICT
UPC 101	6	1	C	UPC	Mathematics and Physics
UPC 102	6	1	C	UPC	Hydrology and Hydraulics
UPC 103	6	1	C	UPC	Intro to Water and Aquatic Environment Management
UPC 104	6	1	C	UPC	Computer Skills, Databases & GIS-ICT

In semester 2 of year 1, candidates shall take compulsory modules to a value of 30ECTS credits at NU:

Code	ECTS Credit s	Se m	Comp /Opt	Institution	Descriptive title
CEG8512	5	2	C	NU	Integrated River Basin Management
CEG8527	5	2	C	NU	Fundamentals of Conceptual and Numeric Ground Water Modelling
CEG8514	5	2	C	NU	Climate Change Vulnerability, Impacts and Adaptation
CEG8523	5	2	C	NU	Modelling and Forecasting of Floods
CEG8517	5	2	C	NU	Computational Hydraulics
INU8001**	5	2	C	NU	Researching and Writing in Science & Engineering

** Candidates who are native English speakers or who achieve entrance level 3 exam in all categories may take one of the following alternative modules (or, an alternative 10 credit at the discretion of the DPD) instead of INU8001 subject to timetabling constraints:

Code	ECTS Credit s	Se m	Comp /Opt	Institution	Descriptive title
CEG8107	5	2	O	NU	Environmental Engineering in Low and Middle Income Countries

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In semester 1 of year 2, candidates take 30 ECTS consisting of 2 compulsory modules (9 ECTS), one of two optional modules (3 ECTS) and 18 ECTS at any 1 institution (not including NU):

Code	ECTS S Cred its	S e m	Comp /Opt	Institutio n	Descriptive title
EU-AQ-3.X_E (BTU) EM2AUE05 (UNS) UPC - 29861 (UPC)	6	1	C	Any	Hydro-Europe Working as Virtual Company/Institute
EU-AQ-3.Y_E (BTU) EM2AUE08 (UNS) UPC – 29862-2 (UPC) 6420-01H30-0SP-0001 (WUT)	3	1	C	Any	European Language II skills (French/German/Spanish/Polish)
EU-AQ-3.Y_C (BTU) EM2AUE06 (UNS) UPC - 29863 (UPC)	3	1	O	Any	Pre-professional Training OR Research Methodology Also supported by WUT
EM2AUE01 EM2AUE02 EM2AUE03 EM2AUE04	5 3 5 5	1 1 1 1	C C C C	UNS UNS UNS UNS	Modelling Methods for Urban Waters Methods for Water Supply and Waste Water Treatment Economical and Legal Environments Project Management for Smart Water Solutions
EU-AQ-3.1-C	6	1	C	BTU	Numerical Simulation: Free-surface and Groundwater Modelling
EU-AQ-3.2-C EU-AQ-3.3-C	6 6	1 1	C C	BTU BTU	Information Management in Hydroinformatics Modelling Process in Hydroengineering
1110-ISISR-MSA-3508 (WUT) 1110-ISISR-MSA-3509 (WUT) 1110-ISISR-MSA-3510 (WUT) 1110-ISISR-MSA-3511 (WUT)	3 5 5 5	1 1 1 1	C C C C	WUT WUT WUT WUT	Elements of Hydrogeology Groundwater Flow and Transport Groundwater Management and Optimization Groundwater Protection
UPC 301 UPC 302 UPC 303 UPC 304	3 5 5 5	1 1 1 1	C C C C	UPC UPC UPC UPC	Artificial Neural Network for Decision Support Systems Flood Risk Concepts and Application in River Basin Management DSS for Flood Risk in Urban Areas Real Time Control and Operation of Irrigation Canals, Rivers and Reservoirs

In semester 2 of year 2, candidates shall take one of the following modules worth 30 ECTS credits at any private or public institution:

Code	ECTS Credit s	Sem	Comp /Opt	Institutio n	Descriptive title
EU-AQ-4.1_C EM2AUE07 (UNS) UPC – 29860b (UPC)	30	2	O	Any	Research and Development Project Also supported by WUT
EU-AQ-4.1_E EM2AUE07 (UNS) UPC – 29860a (UPC)	30	2	O	Any	Professional Practice Also supported by WUT

In the summer between Year 1 and Year 2 students may take part in an Action III activity fully integrated in the MSc programme consisting in a 3-month mobility at a non-European partner institutions during which students may take modules up to 10 ECTS (which will replace the equivalent number of credits in semester 1 of year 2):

Code	ECTS credits	Comp/Opt	Institution	Descriptive title
Module 3.1	5 ECTS	O	NUS	Hydrodynamics and Sediment Transport
Module 3.2	5 ECTS	O	NUS	Advance FiniteElement Method
Module 3.3	5 ECTS	O	NUS	Neural Networks
Module 3.4	5 ECTS	O	NUS	Evolutionary Computation
Module 3.5	5 ECTS	O	NUS	Engineering Economics and Project Evaluation
Module 3.6	5 ECTS	O	NUS	System Modelling and Advanced Simulation
Module 3.7	5 ECTS	O	NUS	DecisionAnalysis
Module 3.520	3 ECTS	O	IITM	Oceanography
Module 3.521	3 ECTS	O	IITM	WaveHydrodynamics
Module 3.5.22	3 ECTS	O	IITM	Numerical Techniques in OceanHydrodynamics
Module 3.5.23	3 ECTS	O	IITM	Coastal Engineering
Module 3.B1	6 ECTS	O	EPFL	Stochastic models and statistical methods in hydrology
Module 3.B2	6 ECTS	O	EPFL	Hydrologic forecasting and risk - specialisation module
Module 3.B3	5 ECTS	O	EPFL	Snow and glacier hydrology - specialisation module
Module 3.C2	6 ECTS	O	EPFL	Dams and hydraulic engineering works - specialisation module
Module 3.C3	6 ECTS	O	EPFL	Hydroelectric power schemes - specialisation module
Module 3.D1	4 ECTS	O	EPFL	Integrated water resources management
Module 3.D2	5 ECTS	O	EPFL	Flood management and river training works
Module 3.D3	4 ECTS	O	EPFL	Hydrology, water supply, drainage and sewer in urban areas
Module 3.28	5 ECTS	O	UNL	Hydrodynamics of Water Bodies
Module 3.29	5 ECTS	O	UNL	RemoteSensingApplied to Hydrology
Module 3.30	5 ECTS	O	UNL	Groundwater Flow Modelling
Module 3.31	5 ECTS	O	UNL	Introduction to Geostatistics
Module 3.32	5 ECTS	O	UNL	Stability of ErodibleChannels
Module 3.33	5 ECTS	O	UNL	Sediment Transport
Module 3.34	5 ECTS	O	UNL	Urban Drainage
Module 3.35	5 ECTS	O	UNL	GIS for Water Resources Management
Module 3.1	5 ECTS	O	INU	Urban waters management & smart water solutions
Module 3.2	5 ECTS	O	INU	Hydroinformaticssystems
Module 3.3	5 ECTS	O	INU	Inland&coastal Waters Management
Module 3.4	5 ECTS	O	INU	Decision Support System
Module 3.5	5 ECTS	O	INU	Sustainable Water Management
Module 3.1	5 ECTS	O	HHU/NCWU	Hydroelectricity production and management
Module 3.2	5 ECTS	O	HHU/NCWU	Smart water solutions for large hydro projects
Module 3.3	5 ECTS	O	HHU/NCWU	Design and implementation of large hydraulic infrastructures
Module 3.4	5 ECTS	O	HHU/NCWU	Decision Support System for flood and drought management
Module 3.5	5 ECTS	O	HHU/NCWU	Sustainable Water Management at basin scale
Module 3.1	5 ECTS	O	UFRJ	Urban waters: MODCEL model application
Module 3.2	5 ECTS	O	UFRJ	Hydroinformaticssystems: computationalmodels
Module 3.3	5 ECTS	O	UFRJ	Flood risk management
Module 3.4	5 ECTS	O	UFRJ	Decision Support System
Module 3.5	5 ECTS	O	UFRJ	Sustainable Water Management
Module 3.1	5 ECTS	O	UNAM	Urbanhydrology
Module 3.2	5 ECTS	O	UNAM	Hydroinformatics systems: 1D and 2D models

Module 3.3	5 ECTS	O	UNAM	Hydropower production: design and operation of powerplants
Module 3.4	5 ECTS	O	UNAM	Physical models of hydraulic structures
Module 3.5	5 ECTS	O	UNAM	Sustainable Water Management

List of Partner institutions:

- NUS = National University of Singapore (Singapore)
- IITM = Indian Institute of Technology Madras (India)
- EPFL = Ecole Polytechnique de Lausanne (Switzerland)
- UNL = UniversidadNacionaldelLitoral (Argentina)
- INU = Incheon National University (South Korea)
- HHU = HohaiUniversity (China)
- NCWU = North-China Water University (China)
- UFRJ = UniversidadeFederal do Rio de Janeiro (Brasil)
- UNAM = UniversidadNacionalAutónoma de México (Mexico)