

DIPLOMA SUPPLEMENT

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INFORMATION ABOUT THE IDENTITY OF THE DEGREE HOLDER

Name: Yang Aikerem
Date of birth: 4 March 1995
Place of birth: Guiyang, China
Student number: 1092263

INFORMATION ABOUT THE DEGREE

Name of the qualification: Master of Science in Water Science and Engineering
Specialisation: Flood Risk Management
Obtained on: 5 September 2024
Awarding institution: IHE Delft Institute for Water Education
IHE Delft is the largest international graduate water education facility in the world. Based in Delft, Netherlands, IHE Delft confers fully accredited MSc degrees and PhD degrees in collaboration with Dutch partner universities. The Institute contributes to the achievement of the water-related UN sustainable development goals through education, research and capacity development.

INFORMATION ABOUT THE STUDY PROGRAMME

Name of the study programme: MSc programme in Water Science and Engineering with specialisation Flood Risk Management
Partners: Universitat Politècnica de Catalunya - BarcelonaTech
University of Ljubljana
Technische Universität Dresden
Language of instruction / examination: English
Mode of study: Full time

INFORMATION ABOUT THE DEGREE LEVEL

Level of the qualification: EQF-level 7, Research university Masters degree
Minimum required credits: 120 ECTS credits
Study load per credit: 1 ECTS equals 28 hours of study load
Entrance requirements: University-level Bachelor's degree in an appropriate field of study.
B2 level of English in the European reference scheme.
Accreditation: Obtained from NVAO on 25 July 2019



This Diploma Supplement follows the model developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended.



INFORMATION ABOUT THE CONTENTS AND RESULTS GAINED

Final qualifications of the programme

After successful completion of the programme graduates will be able to:

Knowledge and understanding

- 1 Graduates will have a broad scientific knowledge about conservation, restoration and management measures to overcome challenges imposed on water by humans and by climate change
- 2 Graduates will have an understanding of advanced and appropriate information and communication technologies and data science, and their use in building technologies supporting flood risk management
- 3 Graduates will have a comprehensive knowledge base and understanding of the current theory and practice relating to flooding and flood management
- 4 Graduates will demonstrate knowledge and understanding of hydrological, hydraulic and environmental processes and phenomena, and their inter-relationships, in natural and built environments
- 5 Graduates will have knowledge of contemporary global water issues, challenges, debates and developments

Applying knowledge and understanding

- 6 Graduates will be able to apply sophisticated hydroinformatics and modelling tools, best practices and information and communication technology to address the problems of flood risk management
- 7 Graduates will be able to apply specific practical skills, such as identifying the major physical processes in a given river basin or coastal zone and their interaction with the associated assets and receptors
- 8 Graduates will be able to integrate monitoring, modelling and information to support safe and reliable decision making
- 9 Graduates will have the ability to contribute to interdisciplinary and evidence-based knowledge development and problem solving
- 10 Graduates will be able to apply appropriate modelling and data management tools related to hydrological, hydraulic, morphological and environmental processes, to support management and engineering interventions
- 11 Graduates will have the ability to conduct research independently in a scientifically sound and ethically responsible manner

Making judgements

- 12 Graduates will have the ability to interpret research findings critically in order to formulate evidence-based conclusions, solutions and/or recommendations
- 13 Graduates will have the ability to critically discuss and evaluate own research approaches and outcomes within the context of existing knowledge and approaches
- 14 Graduates will have the ability to identify and appraise relevant research, concepts and approaches in view of their potential for helping understand or solve water-related problems
- 15 Graduates will be able to advise on a basin-wide approach to flood risk management
- 16 Graduates will be able to identify the links between all issues related to flooding in order to apply an integrated approach using the best tools to support decision making for the sustainable management of floods
- 17 Graduates will be able to apply engineering creativity and design skills, both independently and in multidisciplinary teams
- 18 Graduates will be able to have a sense of professionalism and an appreciation for the obligations of a professional and be aware of the professional and ethical issues encountered in scientific and engineering practice

Communication

- 19 Graduates will have the competencies to communicate cooperate effectively across disciplines and cultures to enhance collaborations in teams in multi-/interdisciplinary and intercultural teams
- 20 Graduates will have the competencies to debate and defend findings and insights, in a clear, systematic and convincing manner
- 21 Graduates will have the competencies be able to : -communicate and present effectively , both in writing and orally, making use of employing the appropriate information and communication technologies suited for the audience and the purpose

Life long learning skills

- 22 Graduates will have the competencies to further develop and expand their knowledge and skills on their own initiative

RESULTS

Module	Name	Year	Result	Credits
<i>At Technische Universität Dresden</i>				
	Geodesy	2023	3.0	5
	Soils	2023	3.7	5
	Climatology and hydrology	2023	2.5	5
	Flood Risk Management II	2023	2.5	10
	Hydraulic Engineering	2023	3.0	5
	Hydrochemistry	2023	4.0	5
<i>At IHE Delft</i>				
M079	Computational Intelligence and Operational Water Management	2023	6.8	5
M146	Fieldtrip for Flood Risk Management	2023	Pass	5
M013	River Basin Modelling	2023	6.6	5
M014	Flood Risk Management	2023	7.6	5
M015	Decision Support Systems in Water Domain	2023	8.0	5
M087	Urban Flood Management and Disaster Risk Mitigation	2023	7.8	5
The IHE Delft average of the marks mentioned above is			7.4	
<i>At University of Ljubljana</i>				
	Spatial Planning for Flood Protection	2024	8	5
	Socio-Economical Assessment of Flood Protection	2024	9	5
<i>At Universitat Politècnica de Catalunya - BarcelonaTech</i>				
	Fluvial Morphodynamics	2024	8.7	5
	Coastal flooding: impacts, conflicts and risks	2024	9.0	3
	Debris Flow and Flash Flood. Risk, Vulnerability, Hazard and Resilience concepts	2024	7.0	5
	Global warming effects, Flood and Drought Management	2024	7.8	3
	The Application of Radar-based Rainfall Observations and Forecast in Early Warning Systems and Flood Forecasting	2024	7.0	4
<i>At Technische Universität Dresden</i>				
TM	MSc research, thesis and defence	2024	2.0	30

Total ECTS

125

Thesis title: Improving flood forecasting for small catchments using LSTM Networks and advanced feature engineering

Committee: Prof. N. Schütze (chair)
C. Bertini PhD, MSc (external member)
T. Morgenstern MSc

INFORMATION ON THE FUNCTION OF THE QUALIFICATION

The MSc degree gives access to the PhD programmes of the Dutch universities and many universities abroad.

ADDITIONAL INFORMATION

Programme structure

The programme is conducted over a period of 24 months during two academic years.

The **Taught Part** is formed by 3 semesters.

The first semester consists of 30 ECTS and is offered by Technical University of Dresden. The semester consists of 5 courses.

The second semester consists of 30 ECTS and is offered by IHE. It consists of 6 modules. A module consists of a teaching period (usually 3 weeks) and an exam period (at the end of each two consecutive modules). Modules may be shared between or among specialisations and/or programmes.

The first part of the third semester is offered jointly by BarcelonaTech (UPC, Barcelona). It consists of 4 courses and is of 20 ECTS.

The second part of the third semester is offered by University of Ljubljana. This part consists of 2 courses and is of 10 ECTS.

The **Thesis Research Part** consists of a period of six months of individual research and writing of the thesis. The MSc thesis is defended publically at the end.

Grading scheme IHE Delft		Grading scheme TU Dresden		Grading scheme University of Ljubljana	
Assessment results (including the thesis examination) are represented on a scale of 1.0 to 10.0, with one decimal of accuracy. Marks 6.0 and higher indicate a pass. The following grading scale is used.		1.0 – 1.5	"very good"	10	excellent: outstanding results with negligible mistakes
		>1.5 – 2.5	"good"	9	very good: high pass with minor mistakes
		>2.5 – 3.5	"satisfactory"	8	very good: sound knowledge
		>3.5 – 4.0	"sufficient"	7	good: sound knowledge with major mistakes
		>4.0	"insufficient"	6	satisfactory: adequate knowledge suiting minimum criteria
Mark	Description	Grading scheme TU Catalonia		5 - 1	insufficient: failure, poor knowledge below minimum criteria
9.0 - 10.0	excellent	MH Honors	given on exceptional occasions	Candidates with grades satisfactory (6) or more, have passed the examinations successfully. The student has two grades per subject: separately theory and lab exercise (seminar work). For thesis there are also two grades: written report and presentation, both should be more than 6. Finally we have one grade for thesis and common final grade of study (special formula).	
8.0 - 8.9	very good	from 9.0 to 10.0	excellent		
7.0 - 7.9	good	from 7.0 to 8.9	very good		
6.0 - 6.9	sufficient	from 5.0 to 6.9	satisfactory		
5.9 and below	fail	from 4.0 to 4.9	marginal fail		
		from 0.0 to 3.9	fail		
		NP	not examined		
		R	recognition		

SUPPLEMENT CERTIFICATION

Place and date of issue:

Delft, 5 September 2024

Signature:

Stamp: