



TPM Water and Delta Systems Specialization

An electives package for 2nd year MSc students at TU Delft

Why Water- and Delta Systems?

Water is essential for societies and eco-systems. Globally, water systems are under pressure from ongoing socio-economic development and climate change. Water-related issues - like flooding and drought, access to drinking water and sanitation, sea-level rise and land subsidence, and ecosystem and environmental degradation - are high on political agendas and in the actions of international organizations and NGOs. These issues are especially prevalent and urgent in urbanizing deltas, the regions in the world that manifest themselves as socio-economic powerhouses and vital ecological areas.

These water challenges are closely intertwined with challenges in energy and resources, food and hunger, geopolitical security, biodiversity and eco-systems, environmental health and safety, equality and equity, urbanization and poverty, transport and industry. This implies that 'systems thinking,' a multi-actor approach, a values perspective, and multi-level approach to governance are needed in order to tackle the consequences of climate change in delta regions and to meet United Nations Sustainable Development Goals.

Embedding at TU Delft and TPM

Water education and research form a spearhead of TU Delft. TU Delft is also considered among the top-10 institutions worldwide in Water Resources and Marine/Ocean Engineering¹. Water-related courses offered at the Faculty of Civil Engineering and Geosciences and the Faculty of Architecture and the Built Environment focus on physical and environmental engineering and design of natural and human-made water systems. The TPM specialization complements water education at TU Delft with a multi-actor, governance and values perspective. It enables 2nd year master students to expand their TPM

¹ See e.g. <https://www.tudelft.nl/en/education/information-and-experience/world-rankings/> and <https://www.tudelft.nl/en/about-tu-delft/facts-and-figures/tu-delft-in-international-rankings/>

skills –systems analysis, complex systems modelling, design of socio-technical systems – with knowledge of water science, engineering, and governance. Learning objectives pertain to developing a holistic, socio-technical-environmental perspective on water- and delta systems. Electives convey the expertise and experience of TPM lecturers working in the water and delta domain, confront students with real-world water and delta systems and their challenges, develop students’ capability to analyze, understand, model and responsibly design solutions (or interventions) that adapt water and delta systems to current and future challenges. This specialization is an excellent preparation for engaging in water-related thesis projects under guidance of TPM faculty. The package of electives targets 2nd year students of TPM MSc programmes, and is open to students from other faculties (see ‘Entry requirements’ below).

Study experience and graduate outlook

There is an exceptional job market for TU Delft graduates in the area of water and delta systems, both in the Netherlands and internationally. Thanks to the strong water and delta portfolio of the TU Delft, there are ample opportunities for students to benefit from direct interactions with staff at TPM, other TU Delft faculties, and nearby organizations working in water and delta research, consultancy, governance, management and operations. TU Delft initiatives like Delft Global, Delta Futures lab, Delta Infrastructures and Mobility Initiative (DIMI), and The Green Village, facilitate interactions with TU Delft colleagues and many external parties, such as the Ministry of Infrastructure & Water, the Delta Programme, Eco-shape, Deltares, IHE, Rijkswaterstaat, Hoogheemraadschap van Delfland, international organizations, and consultancy firms. This enables direct collaboration in MSc/PhD projects, Living Labs, internships and on-site learning.

Assembling your course package

The electives package consists of 6 elective courses. We recommend that you take the 2 courses offered in Q1 and add 1-3 elective courses from this package that are offered in Q2. The Q1 courses were developed especially for this specialization/ electives package. They provide the prior knowledge and skills that are assumed to have been acquired before taking the Q2 electives. There are three, scheduled accompanying activities in Q1: a one-day, joint kick-off event with lecturers and students in week 1, a one-day river excursion in week 3 (attendance expected), and a research and thesis fair in week 8 or 9 (for students planning to write a MSc thesis under guidance of TPM staff).

Required prior knowledge

All courses assume that you are enrolled in a TU Delft MSc programme, have a background in engineering, are familiar with systems analysis and systems thinking concepts, and are curious about water and delta systems. We assume a ‘growth mindset’ and support students who want to expand their horizon beyond their core background. However, depending on your background you may or may not have the conceptual or quantitative, socio-technical system analysis skills that are needed for some courses. Table 1 aims to provide a quick overview. The TU Delft Study Guide provides detailed course descriptions, with expected prior knowledge and learning goals. It is your responsibility to acquire the expected prior knowledge and skills at the start of the course.

Table 1. Match between study background of various TU Delft MSc programmes and courses offered as part of this specialization.

			EPA	CoSEM	IE	MoT	CI TG/ EE	Arch/ Urbanism
Q1	TPM801	Introduction to Water Governance in Deltas	Yes	Yes	Yes	Yes	Yes	Yes
	TPM802	Model-based Assessment of Water Systems	Yes	Yes	?	?	Yes	?
Q2	TPM803	Building with Nature and Beyond	Yes	Yes	?	?	Yes	?
	TPM804	Adaptive Planning for Management of Water Systems	TPM801	TPM801	TPM801	TPM801	TPM801	TPM801
	TPM003A	Water Ethics	Yes	Yes	Yes	Yes	Yes	Yes
	TPM026A	System Reliability in Quantitative Risk Assessment	Yes	Yes	?	?	Yes	No

“Yes” indicates that prior knowledge ought to be sufficient; “TPM801” means that TPM804 expects that student masters the knowledge taught in TPM801; “?” indicates that, before enrollment, you must consult the study advisor to determine whether your earlier training and MSc courses suffice for succeeding in this course.

Contact

In case of questions, please contact the coordinators Lisa Scholten (l.scholten@tudelft.nl) and Tineke Ruijgh-van der Ploeg (M.P.M.Ruijgh-vanderPloeg@tudelft.nl).