

Module: Water Management

Level	Bachelor	Short Name	WAW
Responsible Lecturers	Külls		
Department, Facility	Applied Natural Sciences		
Course of Studies	Environmental Engineering and Management, Bachelor		
Compulsory/elective	Compulsory	ECTS Credit Points	5
Semester of Studies	4	Semester Hours per Week	4
Length (semesters)	1	Workload (hours)	150
Frequency	SuSe	Presence Hours	60
Teaching Language	German/English	Self-Study Hours	90

The following section is filled only if there is **exactly one** module-concluding exam.

Exam Type	Portfolio Exam	Exam Language	German/English
Exam Length (minutes)		Exam Grading System	One-third Grades
Learning Outcomes	The students understand the physical relationships in the field of hydrology and water management. They know the basics of assessing water quality (drinking water, municipal wastewater, bodies of water), dimensioning and balancing hydrological quantities, evaluating drainage concepts, assessing wastewater treatment processes, processing methods and drinking water qualities, and dimensioning and optimizing sewage treatment plants.		
Participation Prerequisites			

The previous section is filled only if there is **exactly one** module-concluding exam.

Consideration of Gender and Diversity Issues	<ul style="list-style-type: none"> ✓ Use of gender-neutral language (THL standard) ✗ Target group specific adjustment of didactic methods ✗ Making subject diversity visible (female researchers, cultures etc.)
Applicability	
Remarks	

Module Course: Lecture on Water Management

(of Module: Water Management)

Course Type	Lecture	Form of Learning	Presence
Mandatory Attendance	no	ECTS Credit Points	3
Participation Limit		Semester Hours per Week	2
Group Size		Workload (hours)	90
Teaching Language	German/English	Presence Hours	30
Study Achievements ("Studienleistung", SL)		Self-Study Hours	60
SL Length (minutes)		SL Grading System	

The following section is filled only if there is a course-specific exam.

Exam Type		Exam Language	
Exam Length (minutes)		Exam Grading System	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	<ul style="list-style-type: none"> • Hydrology and water management <ul style="list-style-type: none"> • Sustainable water management, EU Water Framework Directive • Discharge and flood management • Drought and extremes, evaporation • Groundwater protection and management • Urban water management <ul style="list-style-type: none"> • Introduction to urban water management • Rules and regulations • Water supply and drinking water treatment • Urban drainage including storm drainage • Wastewater treatment <ul style="list-style-type: none"> • Wastewater characterization – assessment of analysis data • Mechanical and biological treatment • Advanced treatment • Sewage sludge treatment • Treatment of industrial wastewater • Metrology <ul style="list-style-type: none"> • Hydrometry • Gauge systems • Discharge measurement, in-situ, • Data evaluation • Field internship
-----------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>Literature</p>	<ol style="list-style-type: none"> 1. Maniak, U. (2005). <i>Hydrologie und Wasserwirtschaft: Eine Einführung für Ingenieure</i>. Springer-Verlag. 2. Wittenberg, H. (2011). <i>Praktische Hydrologie</i>. Vieweg+ Teubner. 3. Lecher, K., Lühr, H.-P., & Zanke, U. (Hrsg.). (2021). <i>Taschenbuch der Wasserwirtschaft: Grundlagen – Maßnahmen – Planungen</i> (10. Auflage). Springer Vieweg. 4. Morgenschweis, G. (2010). <i>Hydrometrie: Theorie und Praxis der Durchflussmessung in offenen Gerinnen</i>. Springer-Verlag. 5. Strobl, T., & Zunic, F. (2006). <i>Wasserbau</i>. Springer-Verlag Berlin Heidelberg. 6. Patt, H., Jürging, P., & Kraus, W. (2011). <i>Naturnaher Wasserbau</i>. Springer Berlin Heidelberg. 7. DWA-Arbeitsblätter 8. Gujer, W. (2007). <i>Siedlungswasserwirtschaft</i> (Vol. 3). Berlin: Springer. 9. Hosang, W. (2013). <i>Abwassertechnik</i>. Springer-Verlag.
<p>Remarks</p>	

Module Course: Water Management (Exercise)

(of Module: Water Management)

Course Type	Exercise	Form of Learning	Presence
Mandatory Attendance	no	ECTS Credit Points	2
Participation Limit		Semester Hours per Week	2
Group Size		Workload (hours)	60
Teaching Language	German/English	Presence Hours	30
Study Achievements ("Studienleistung", SL)		Self-Study Hours	30
SL Length (minutes)		SL Grading System	

The following section is filled only if there is a course-specific exam.

Exam Type		Exam Language	
Exam Length (minutes)		Exam Grading System	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	<p>Selected parts of the lecture are illustrated with examples</p> <p>Students learn through the exercises:</p> <ul style="list-style-type: none"> • How to set up water balance equations • How to carry out runoff calculations • How to calculate design rainfall and flood hydrographs • How to calculate components of urban drainage • How to design sewage treatment plant components • How to calculate groundwater flow • How to apply mass transport equations
Literature	
Remarks	