

# Module Card

Master Resource Efficiency in  
Architecture and Planning  
HCU Hamburg

Module Number	Module Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
REAP-M-Mod-203	Urban Water Cycles	C	2.	Prof. Dr. Wolfgang Dickhaut

Subject Area	Duration
Fundamentals and Methods	1 semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h workload)	3 (= 31,5 h contact time)	118,5 h

## Objectives and Contents

### Objective of Qualification (competencies)

- Understanding of the basic water-cycle situation in urban areas and the key strategies for sustainable water resource management.
- Skills development: perception, assessment and decision making in the field of water-cycle management.

### Contents

- Water-cycle in urban areas – present situation and key strategies, using international examples:
  - The water-cycle in urban areas, differences from the natural water-cycle (precipitation e.g. rainfall, rate of flow, infiltration, evaporation, differences between the world's regions, available water supply in urban areas, differences between the world's regions, effective water consumption in urban areas, differences between the world's regions (communal, industrial, agricultural), potential for change) Water-cycle in buildings (differences in consumption between different users).
  - Flowing waters and groundwater in urban areas, differences from natural flowing water and groundwater.
  - Wastewater and its impact on human beings water bodies, potentials for recycling, criteria for treatment selection.
- Overview of alternative technologies in water supply and rainwater/ wastewater treatment:
  - Consolidation of standard technologies of water supply, wastewater treatment and rainwater treatment (in Europe), e.g. centralized wastewater plants (treatment processes, mechanical and biological; sewer system).
  - Wastewater: Potentials for recycling, criteria for treatment selection, advantages and disadvantages of different treatment systems.
  - Different key strategies for wastewater/ rainwater harvesting (e.g. ECOSAN, ecological sanitation): centralised and decentralised technologies, High tech and low tech solutions, Separation of wastewater streams.
  - Overview of present technologies in wastewater and rainwater management (e.g. for wastewater: grey water treatment, water toilets with liquid/ solid separation, dry toilets, membrane filtration, biogas plant; for rainwater: rainwater usage, decentralised rainwater infiltration).

### Recommended Literature

- Hoyer, Jacqueline / Dickhaut, Wolfgang / Kronawitter, Lukas / Weber, Björn; Water Sensitive Urban Design – Principles and Inspirations for Sustainable Stormwater Management in the City of the Future; Jovis Verlag, 2011
- United Nations Environment Programme, 2008, Every Drop Counts Environmentally Sound Technologies for Urban and Domestic Water Use Efficiency
- SUSTAINABLE SANITATION AND WATER MANAGEMENT TOOLBOX; <http://www.sswm.info/>
- The United Nations World Water Development Report 3; WATER IN A CHANGING WORLD; 2009

### Teaching and Learning Methods

Lecture (complemented by seminar discussions, individual student inputs for specific subjects).

## Exam(s)

### Precondition of Examination

regular participation, successful completion of student report and oral presentation.

Type of Examination	Duration of Examination (if written or oral exam)
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Term paper (S) comprising report (R).	
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### Composition of Module Mark

Exam grade	
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**Additional Information**

Previous Knowledge / Conditions for Participation (in form and content)
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| <ul style="list-style-type: none"><li>• Awareness of the water-cycle, ecological topics and the standard technologies of water supply. Wastewater treatment and rainwater treatment (in Europe). (Content)</li></ul> |
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Applicability of Module
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The successful completion of this module is required for the attendance of the module REAP-M-Mod-204 Project II.
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Frequency of Offering
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Each Summer term
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Course Language
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English
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Update: 30.09.16
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