

## IGSH 2018 Course Program – Groundwater and Urbanization: September 12 – 26, 2018

### Week - 1

Date	Time	Activities	Speakers/Lead
Wednesday, 12-09-2018		Arrival of Participants	
	17:00	Campus Tour and Welcome Dinner	Applied Geology group, RUB
Thursday, 13-09-2018	08:30 – 09:30	Welcome lecture: Brief introduction to the course, organizational affairs and the Ruhr University	Prof. Dr. Stefan Wohnlich, Applied Geology, RUB
	09:30 – 10:15	Welcome lecture: The multiple transformations of the urban landscape Ruhr - Introducing its physical environment, economy and demography	Prof. Dr. Harald Zepp, Applied Physical Geography, RUB Dean of the Faculty of Geosciences
	10:30 – 12:00	Workshop: Introduction of participants and short presentations by participants	All participants and lecturers
	13:15 – 16:45	Workshop: Introduction of participants and short presentations by participants	All participants and lecturers
	17:00	City tour: Visit to the city of Bochum	Applied Geology group, RUB
Friday, 14-09-2018	08:30 – 12:00	Lecture/Exercise: Basics of urban Hydrogeology and Monitoring I	Dr. Andreas Englert, Hydrogeology, University of Cologne
	13:15 – 14:45	Lecture/Exercise: Basics of urban Hydrogeology and Monitoring II	Prof. Dr. Stefan Wohnlich, Applied Geology, RUB
	15:00	Workshop: Group forming and project discussion	All participants and group leaders
Saturday, 15-09-2018	09:00 – 13:00	Field trip: Mining heritage in the Ruhr Area: Zeche Zollverein	Guided tour in former mine; Applied Geology group, RUB
Sunday, 16-09-2018		Free day	
Monday, 17-09-2018	08:30 – 12:00	Lecture/Exercise: Water quality issues and introduction to hydrogeochemical modelling in urban environments	Dr. Andre Banning, Applied Geology, RUB
	13:15 – 16:30	Lecture/Exercise: Water Supply and Management in Teheran/Iran	Dr. Ali Mahdavi Mazdeh Imam Khomeini International University, Qazvin, Iran; RUB guest lecturer
	16:45	IGSH Barbecue around Lake Kemnade, Bochum	All participants and lecturers
Tuesday, 18-09-2018	08:30 – 12:00	Field trip: Institute for Underground Infrastructure (IKT), Gelsenkirchen	C. Bennerscheidt, IKT Applied Geology group, RUB
	13:15 – 16:30	Lecture/Exercise: Flow and Transport in Urban Groundwater Systems	Dr. Andreas Englert, Hydrogeology, University of Cologne
	16:45	Field trip: Hydrological and cultural visit to Cologne city centre	Dr. Andreas Englert, Hydrogeology, University of Cologne

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### Week – 2

<b>Date</b>	<b>Time</b>	<b>Description</b>	<b>Speakers/Lead</b>
Wednesday, 19-09-2018	08:30 – 12:00	Lecture/Exercise: Urban water resources characterization: use of isotopes	Dr. Andrea Niedermayr, Applied Geology, RUB
	13:15 – 16:30	Lecture/Exercise: Future of urban energy supply? Geothermal energy and pumped storage plants	Prof. Dr. Stefan Wohnlich, Applied Geology, RUB
	16:45	Workshop: Discussions in working groups and evaluation of first results	All participants and group leaders
Thursday, 20-09-2018	08:15 – 12:00	Field exercises Groundwater monitoring and sampling techniques Lake Kemnade well field, Bochum	Dr. A. Niedermayr, T. Gökpinar Applied Geology, RUB
	13:15 – 17:00	Field trip: Water Management in the Ruhr-Metropolitan Area: Emscher Project, Phoenixsee Project	Prof. Dr. Stefan Wohnlich, Applied Geology, RUB
Friday, 21-09-2018	08:30 – 12:00	Lecture/Exercise: Urbanization: consequences for agricultural development	Prof. Dr. Frank Eulenstein, Leibniz-Zentrum für Agrarlandschafts- forschung, Müncheberg
	13:15 – 16:30	Lecture/Exercise: Impacts of climate change on the urban water cycle	Prof. Dr. Steffen Bender, Climate Service Center Germany, Hamburg
Saturday, 22-09-2018		Free day	
Sunday, 23-09-2018	12:45 – 19:00	Cultural field trip: History, architecture and landscape in the Münsterland and eastern Westphalia	Applied Geology group, RUB
Monday, 24-09-2018	08:30 – 11:45	Field trip: Anthropogenic impacts on urban soils – heavy metals in the Bochum city area	M.Sc. Michael Meid CDM Smith Consult, Bochum
	13:00 – 15:45	Lecture/Exercise: Trace organics in the urban water cycle	Dr. Christian Skark, Institute of Water Research, Schwerte
	16:00	Workshop: Discussion in working groups: open questions and presentation of concepts	All participants and group leaders
Tuesday, 25-09-2018	08:30 – 13:00	Written examination (8:30-9:30); Participants present their group project (9:45-11:45); Final discussion, course evaluation by participants, award of certificates (12:00-13:00)	All participants and lecturers
	13:30 – 15:00	Farewell lunch	
Wednesday, 26-09-2018		Departure of participants	