Titel des Wahlpflichtmoduls:	**Hydrogeochemistry**
Fakultät:	Geowissenschaften
Name der Dozentin/des Dozenten / Kontaktdaten:	Prof. Dr. Tobias Licha tobias.licha@rub.de
formale Voraussetzungen:	Einschreibung in den M.Sc. Biologie
inhaltliche Voraussetzungen:	Basic knowledge in Chemistry

	Titel der Veranstaltungen	Leistungsnachweis	CP
1.	177303 Inorganic Hydrogeochemistry with Exercises (WiSe)	Written exam	5
2.	177322 Organic Hydrogeochemistry with Exercises (WiSe)	Written exam	5

Inhaltsangabe:

The module intends to convey a quantitative understanding of chemical processes in the aquatic environment.

The first lecture introduces the essential thermodynamics to understand basic and coupled electrolyte equilibria (i.e. redox processes, acid/base reactions, solubility) in the aquatic environment and is accompanied by simple and complex calculations of real world problems as well as coursework.

The second lecture focuses on the classification of organic compounds and pollutants in the subsurface. Relevant properties are discussed together with property-structure-relationships. The environmental and subsurface behaviour of organic compounds is introduced in terms of relevant distribution equilibria and kinetically controlled processes. Complex examples are provided partially as coursework helping to apply gained knowledge.

The lectures are accompanied by exercises to practice the knowledge using multiple choice tests.
Podcasts and extensive self-study and self-assessment tools are provided on moodle.

A voluntary student tutorial furthers helps to digest the topics.

Literatur:

- Schwarzenbach, R.P. Gschwend, P.M. & Imboden, D.M. (2002): Environmental Organic Chemistry, New York, Wiley.
- Domenico, P.A. & Schwartz, F.W. (1998): Physical and Chemical Hydrogeology, 2nd ed. New York, Wiley.
- Appelo C. A. J. & Postma D. (2005): Geochemistry, Groundwater and Pollution, 2nd ed. CRC Press.
- Worch E. (2015) Hydrochemistry: Basic Concepts and Exercises, Walter de Gruyter GmbH & Co KG.