



Hydro Power Engineering

Mode of Examination K	Mandatory (P)/ Elective (WP) W	Art/SWH 2V / 2Ü	Language English	Credits 6	Sem. 3 (WS)
Level Master	Area of Competence Elective Supplements			Organizer Achmus, Martin	

Learning Objectives

In this course the students acquire extended knowledge about weir and dam construction as well as subsoil sealing. The students achieve general competences in planning, designing and dimensioning of hydro dams and their foundations. Furthermore, they obtain basic knowledge about economical energy aspects, hydropower station components, - design and utilisation as well as usage of hydro power in coastal areas.

After the successful participation in this course the students are able to

- develop basic construction plans for the construction of water supply and power structures;
- carry out basic stability checks on the respective buildings;
- design the above mentioned buildings for stability against erosion and permeability by application of filter laws;
- basic knowledge of designing the respective structures for the purpose of energy generation.

Contents

- design guidelines, principles of construction and dimensioning concepts for barrages
- different construction types and operation modes of hydropower plants
- river power plants and storage power plants
- design of turbines
- hydraulic design of flood spillways
- dam structures, operation and verification of stability
- FE-analyses of dams
- construction of earth-fill dams and subsoil sealing

Workload:	180 h (60 h Präsenz- u. 120 h Eigenstudium einschl. Studien-/ Prüfungsleistung)
Prerequisites:	Environmental Hydraulics, Soil Mechanics for Hydraulic Structures
Literature:	<p>Siddiqui, I. H. (2009): Dams and reservoirs: planning and engineering. Oxford Univ. Press.</p> <p>R. Fell (2005): Geotechnical engineering of dams. Balkema.</p> <p>Hammond, R. (1958): Water power engineering and some electrical problems.</p> <p>Grundbau Taschenbuch, Teile 1-3, Verlag Ernst und Sohn; Hydraulic Structures, P. Novak et al., 4th ed., Taylor & Francis;</p> <p>Wasserkraftanlagen, J. Giesecke & E. Mosonyi, Springer Verlag,</p>



	Heidelberg; Deiche und Erddämme, R. Davidenkoff, Werner Verlag Düsseldorf; Anwendung von Filtern im Wasserbau, R. Davidenkoff, Ernst & Sohn Verlag Berlin.
Media:	StudIP, Script, beamer, blackboard etc.
Particularities:	-
Institute:	Ludwig-Franzius-Institute for Hydraulic, Estuarine and Coastal Engineering Institute for Geotechnical Engineering, Foundation Engineering and Waterpower Engineering