### Hydro Power Engineering

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<th>Mode of Examination</th>
<th>Mandatory (P)/ Elective (WP)</th>
<th>Art/SWH</th>
<th>Language</th>
<th>Credits</th>
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**Level**

Master

**Area of Competence**

Elective Supplements

**Organizer**

Achmus, Martin

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**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:**

Grundbau Taschenbuch, Teile 1-3, Verlag Ernst und Sohn; Hydraulic Structures, P. Novak et al., 4th ed., Taylor & Francis; Wasserkraftanlagen, J. Giesecke & E. Mosonyi, Springer Verlag,
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| Institute:             | Ludwig-Franzius-Institute for Hydraulic, Estuarine and Coastal Engineering  |
|                        | Institute for Geotechnical Engineering, Foundation Engineering and Waterpower Engineering |