Research

- Safety and operation of dams and storage reservoirs
- Stability checks of dams, dikes and rip-raps
- Operational installations at barrages
- Fluidic tests at conventional and marine hydropower systems
- Seals used in hydraulic engineering
- Nature-orientated design of watercourses
- Dimensioning of hydraulic structures considering climate changes
- Embankment training for wave loads
- Investigation of near structure wave movement in coastal and dam engineering
- Sustainable flood management systems for inland waters and coastal areas
- Hydroabrasion and erosion processes caused by flowing water
- Hydraulics of industrial plants; turbulence models
- Hydromechanical aspects of mixing and flocculation processes in water treatment
- Pipe technology (pressure flow, water hammer, strength)
- River morphology
- New technologies and materials in hydraulic engineering
- Hydrometric nature surveys and monitoring programs
- Valuation reports on hydraulic engineering and hydromechanical problems

Physical model test "flood protection in the city of Grimma"

Teaching

The institute presents a wide range of lectures, seminars and internships in line with the requirements of the Bologna Declaration on the standardisation of European Higher Education, offering the subjects for students of civil engineering, water management, hydrology, landscape architecture, transport engineering and geodesy in German, and MSc Hydro Science and Engineering as well as MSc Rehabilitation Engineering in English. The institute also engages in the specialised seminar "Water and Environment".

Content of teaching

- Principles of hydrostatics and hydrodynamics
- Principles of hydraulic engineering
- Hydrography, hydrology and water quality
- Dams
- Hydropower
- River engineering
- Problems concerning urban water bodies and design of water bodies in urban areas
- Waterway engineering
- Coastal structures and coast protection
- Renewable energies and ocean energy utilisation
- Software applications and Computational Fluid Dynamics (CFD)
- Special topics of hydraulic engineering, fluid mechanics, river hydraulics and ecohydraulics
- Ground water
- Hydromechanics, applied hydrodynamics and hydraulic engineering
- Maintenance of hydraulic structures
- Hydraulic research

Institute

Laboratories and experimental facilities

- Hydraulic engineering lab (Hubert-Engels-Laboratory)
- Student's lab (for internships and degree dissertations)
- Outdoor test facility in the Weißeritz valley (steep and shallow channels, discharges of up to 10 m^3/s)

Teaching students in the lab

IT infrastructure

Hardware

Computer pool, multi-processor work stations, connection to the campusnet of the TU Dresden via optic fiber with 100 Mbit/s, access to the Center for Information Services and High Performance Computing (ZIH)

Software

In addition to a wide range of software products commonly employed in science and research, several in-house developments are used.

Library

The library of the Association of Friends and Sponsors of the Hubert-Engels-Institute holds a comprehensive collection of national and international technical literature, textbooks and monographs.

Elbe River – 2D model of Aussig polder

Hubert-Engels-Lab

Competences

Founded in 1898 as the world's first permanent river engineering laboratory, the Hubert-Engels-Laboratory offers the possibility to conduct hydraulic model tests on various issues of hydraulic engineering, including the testing of special structures of hydraulic engineering, hydropower, industrial hydraulic engineering and urban water supply and sanitation, or structures of river and ocean engineering, harbour construction, water treatment and water distribution. Furthermore, hydraulic problems of industrial plants can be examined.

Laboratory equipment

- Area of approx. 815 m², including test hall
- Water circulation with a capacity of approx. 300 l/s, constructed as multi-pipe system
- Glass channel 30.0 m x 0.8 m x 0.8 m
- Wave channel 14.0 m x 0.5 m x 0.5 m
- Large flume through 10.0 m x 0.3 m x 0.4 m
- Small flume through 6.0 m x 0.15 m x 0.3 m
- Pipe test stands
- Flow measurements for discharge under pressure and open channel discharges (IDM, ultrasonic, weirs)
- 1D, 2D and 3D flow measurement units (ADCP, stereo PIV, LDV-3D, 3D ultrasonic, magnetic-inductive, 1D, 2D, wings)
- Water gauge systems (ultrasonic, capacitive wave gauge)
- Pressure measurement systems for absolute and relative pressures (0.01 – 160 bar)
- Vibration, path and expansion measurement systems
- 1D, 2D and 3D traverses
- Wave generators for irregular swell
- Measurement of soil moisture and extraction potential with time domain reflectometry or tensiometers
- Digital and analogue image and video editing
- Electronics, precision engineering and model building shop

Contact

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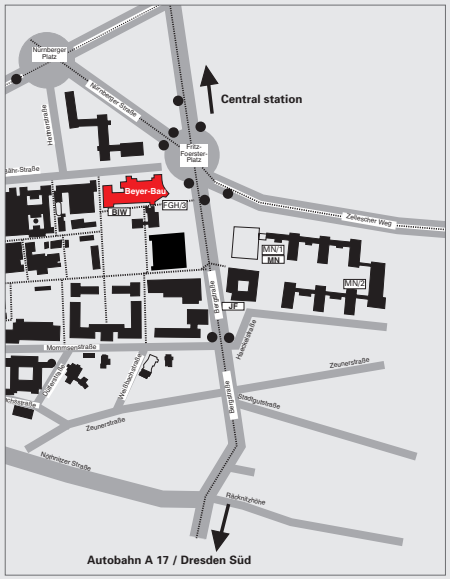
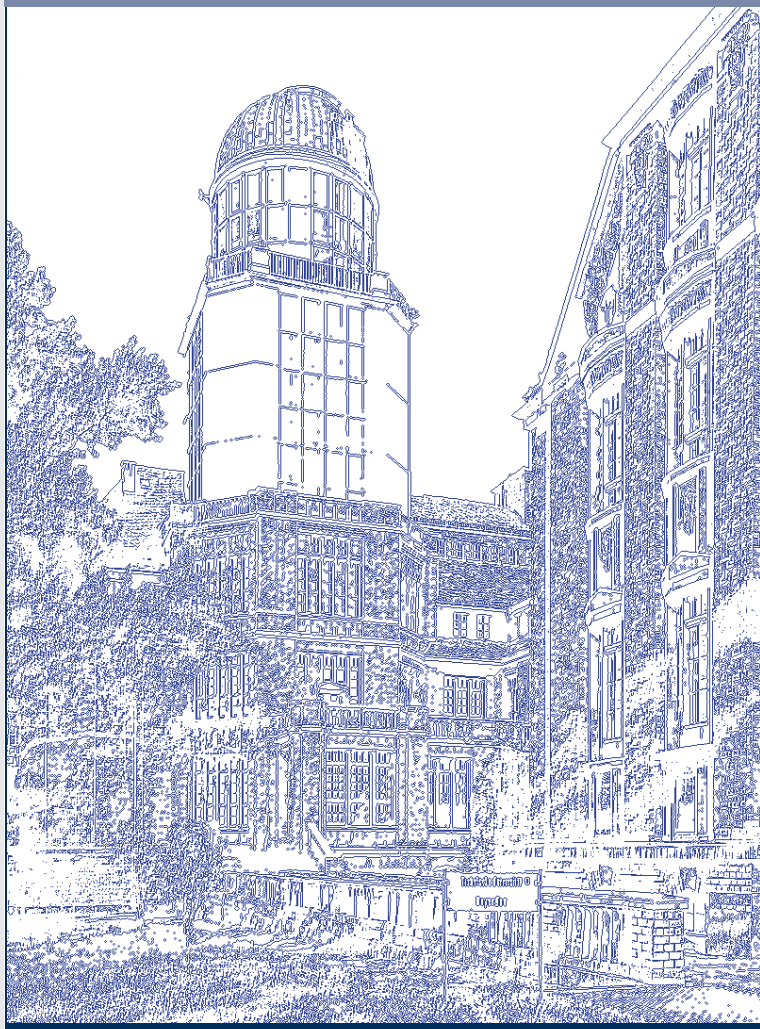


TECHNISCHE UNIVERSITÄT DRESDEN

Faculty of Civil Engineering



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INSTITUTE OF HYDRAULIC ENGINEERING AND TECHNICAL HYDROMECHANICS