

BIWE-01: Design of Concrete Structures (Prof. Curbach/Dr. Ortlempp)

Contents

- 1) Design methods for reinforced concrete members according to existing codes and technical regulations (example EC2)
 - design for flexural loads
 - design for shear loads
 - design for torsional loads
 - design for Columns
- 2) Design-relevant concrete properties
 - obtaining material properties for concrete
 - test methods (destructive and non-destructive)
 - compressive and tensile strength and Young's modulus of concrete
 - tensile strength, Young's modulus and bond of steel reinforcement
 - differences in codes
 - application of the measured values in concrete design
- 3) Load bearing behaviour of concrete under multi-axial loading
 - mechanical properties
 - use cases
- 4) Strengthening methods for reinforced concrete members
 - comparison
 - use cases
 - calculation models
 - shotcrete
 - FRP lamellae and sheets
 - textile reinforced concrete (TRC)
- 5) Methods for plausibility check
- 6) Strut-and tie-models

Prerequisite Knowledge

- Basics of civil engineering and mechanics

Topics of Project and Master Thesis

- Design of building constructions
- Design of bridges
- Various scientific topics, updated at regular intervals (see institutional web site)
- Topics will also be handed out in the lesson

Literature

- Eurocode 2: Design of Concrete Structures
- Fib bulletin 14: Externally bonded FRP-reinforcement for RC structures
- Fib bulletin 17: Management, maintenance and strengthening of concrete structures

Links for possible Topics of Master Thesis

- [Design of Concrete Structures](#)