Advanced Structural Concrete

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Autumn Semester 2020
Advanced Structural Concrete

Objectives and content of the lecture

The lecture Advanced Structural Concrete is a mandatory part of the specialisation in construction in the Master's programme Civil Engineering at the ETH Zurich.

The lecture builds on the basic knowledge of reinforced and prestressed structures, slabs and membrane elements taught in the course Stahlbeton (lectures and exercises Stahlbeton I and Stahlbeton II) in the bachelor's degree.
Learning objectives

Enhancement of the understanding of load-deformation response of reinforced and prestressed (including existing) concrete structures.

Awareness of, and ability to check, the limits of applicability of limit analysis methods.

Knowledge of models suitable for computer-aided structural design and ability for critical use of structural design software.

Understanding of new topics related to the long-term behaviour, behaviour under fire conditions and use of innovative materials.

The knowledge acquired in the Bachelor’s programme is enhanced and expanded. The focus lies on the understanding of the load-bearing and deformation behaviour, as it is required in particular for the correct assessment of the structural safety of existing structures (see Introduction).
The content of the lecture is mostly independent of standards. The expressions and nomenclature are basically according to the Swiss codes (structural standards of the SIA); they are mostly compatible with the Eurocodes.

The exercises are based on the Swiss codes, which were introduced in the course Stahlbeton in the bachelor's degree.

- Paper copy available at ETH Store
  - 85 CHF regular price / 25 CHF student price

- E-Book available at [https://payhip.com/b/DP6N](https://payhip.com/b/DP6N)
  - 60 € regular price / 18 € student price
  - 70% student discount voucher will be sent by e-mail
The content of chapters 2-3 is based on the training course for civil engineers "Load-bearing behaviour of reinforced concrete" held at ETH Zurich in 1999, supplemented by findings from more recent work, particularly in the field of deformation capacity and computer-aided structural design.

Chapter 4 is based on the section "Long-term effects" of the lecture "Stahlbeton III" held by Prof. Menn until 1993.
Organisation Advanced Structural Concrete

Lecture
• Thursday, 09:45-10:30, online (https://ethz.zoom.us/j/94433614507)
• Detailed semester program and lecture materials available online at http://www.concrete.ethz.ch/asc

Exercises
• Enhancement of the understanding of the topics discussed in the lecture
• Introduction to the exercises in the lecture: 01.10., 19.11., 03.12.
• Submission optional, questions can be discussed during the consultation hours

Consultation hours
• Every Tuesday, 15:00 – 16:00, online (https://ethz.zoom.us/j/93364613808)
• Assistant: Nathalie Reckinger
• For questions concerning the lecture or the exercises

Workshop “Compatible Stress fields” (optional)
• Thursday, 12.11., 17:00 – 19:00, online
• More information will follow

Exam
• Oral, 20 minutes, language: English