

Basic principles of concrete structures

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Abstrak

Basic Principles of Concrete Structures is one of the key courses for undergraduates majoring in civil engineering. The objective of this book is to help students to completely understand the basic mechanical properties and design methods of structural members made of concrete and reinforcement and to lay the foundation for future study of the design and construction of various types of reinforced concrete structures.

The book consists of 12 chapters, i.e., introduction, materials, bond and anchorage, axially loaded members, flexural members, eccentrically loaded members, shearing, torsion, punching and local bearing, prestressed concrete members, serviceability of members, and durability of reinforced concrete structures.

The book is suitable for teachers and college students majoring in civil engineering and can also be referred by civil engineers.

The textbook is jointly edited by Prof. Xianglin Gu, Prof. Xianyu Jin, and Dr. Yong Zhou.

As a basic specialty course for undergraduates majoring in civil engineering, Basic Principles of Concrete Structures is different from either the previously learnt mechanics courses or the design courses to be learnt. Compared with mechanics courses, the basic theories of reinforced concrete structures cannot be solely derived by theoretical analysis. And compared with design courses, this course emphasizes the introduction of basic theories rather than simply being a translation of design specifications. That means the course of Basic principles of Concrete Structures should focus on both theoretical derivation and engineering practice. Therefore, based on the latest version of designing codes both for buildings and bridges (GB 50010-2010 and JTG D62-2004), the book starts from the steel and concrete materials, whose properties are very important to the mechanical behavior of reinforced concrete members. Step by step, the design and analysis of reinforced concrete members under basic loading types (tension, compression, flexure, shearing, and torsion) and environmental actions are introduced. The characteristic of the book that distinguishes it from other textbooks on reinforced concrete structures is that more emphasis has been laid on the basic theories of reinforced concrete structures and the application of the basic theories in design of new structures and analysis of existing structures. Examples and problems in each chapter are carefully designed to cover every important knowledge point.