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Nota di contenuto	Intro -- Advanced Concrete Technology -- Contents -- Preface -- 1 Introduction to Concrete -- 1.1 Concrete Definition and Historical Development -- 1.2 Concrete as a Structural Material -- 1.3 Characteristics of Concrete -- 1.4 Types of Concrete -- 1.5 Factors Influencing Concrete Properties -- 1.6 Approaches to Study Concrete -- Discussion Topics -- References -- 2 Materials for Making Concrete -- 2.1 Aggregates -- 2.2 Cementitious Binders -- 2.3 Admixtures -- 2.4 Water -- Discussion Topics -- Problems -- References -- 3 Fresh Concrete -- 3.1 Workability of Fresh Concrete -- 3.2 Mix Design -- 3.3 Procedures for Concrete Mix Design -- 3.4 Manufacture of Concrete -- 3.5 Delivery of Concrete -- 3.6 Concrete Placing -- 3.7 Early-Age Properties of Concrete -- Discussion Topics -- Problems -- References -- 4 Structure of Concrete -- 4.1 Introduction -- 4.2 Structural Levels -- 4.3 Structure of Concrete in Nanometer Scale: C-S-H Structure -- 4.4 Transition Zone in Concrete -- 4.5 Microstructural Engineering -- Discussion Topics -- References -- 5 Hardened Concrete -- 5.1 Strengths of Hardened Concrete -- 5.2 Stress-Strain Relationship and Constitutive Equations -- 5.3 Dimensional Stability-Shrinkage and

Creep -- 5.4 Durability -- Discussion Topics -- Problems -- References -- 6 Advanced Cementitious Composites -- 6.1 Fiber-Reinforced Cementitious Composites -- 6.2 High-Strength Cementitious Composites -- 6.3 Polymers in Concrete -- 6.4 Shrinkage-Compensating Concrete -- 6.5 Self-Compacting Concrete -- 6.6 Engineered Cementitious Composite -- 6.7 Tube-Reinforced Concrete -- 6.8 High-Volume Fly Ash Concrete -- 6.9 Structural Lightweight Concrete -- 6.10 Heavyweight Concrete -- Discussion Topics -- Problems -- References -- 7 Concrete Fracture Mechanics -- 7.1 Introduction -- 7.2 Linear Elastic Fracture Mechanics -- 7.3 The Crack Tip Plastic Zone. 7.4 Crack Tip Opening Displacement -- 7.5 Fracture Process in Concrete -- 7.6 Nonlinear Fracture Mechanics for Concrete -- 7.7 Two-Parameter Fracture Model -- 7.8 Size Effect Model -- 7.9 The Fictitious Model by Hillerborg -- 7.10 R-Curve Method for Quasi-Brittle Materials -- Discussion Topics -- Problems -- References -- 8 Nondestructive Testing in Concrete Engineering -- 8.1 Introduction -- 8.2 Review of Wave Theory for a 1D Case -- 8.3 Reflected and Transmitted Waves -- 8.4 Attenuation and Scattering -- 8.5 Main Commonly Used NDT-CE Techniques -- 8.6 Noncontacting Resistivity Measurement Method -- Discussion Topics -- Problems -- References -- 9 The Future and Development Trends of Concrete -- 9.1 Sustainability of Concrete -- 9.2 Deep Understanding of the Nature of Hydration -- 9.3 Load-Carrying Capability-Durability Unified Service Life Design Theory -- 9.4 High Toughness and Ductile Concrete -- References -- Index.

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#### Sommario/riassunto

Over the past two decades concrete has enjoyed a renewed level of research and testing, resulting in the development of many new types of concrete. Through the use of various additives, production techniques and chemical processes, there is now a great degree of control over the properties of specific concretes for a wide range of applications. New theories, models and testing techniques have also been developed to push the envelope of concrete as a building material. There is no current textbook which brings all of these advancements together in a single volume. This book aims to bridge the gap.

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