

Texts in Theoretical Computer Science An EATCS Series

Texts published in this series are intended mostly for the graduate level. Typically, an undergraduate background in computer science will be assumed. However, the background required varies from topic to topic, and some books are self-contained. The texts cover both modern and classical areas with an innovative approach that may give them additional value as monographs. Most books in this series have examples and exercises.

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Software Engineering 1

The art, craft, discipline, logic, practice, and science of developing large-scale software products needs a believable, professional base. The textbooks in this three-volume set combine informal, engineeringly sound practice with the rigour of formal, mathematicsbased approaches.

Volume 1 covers the basic principles and techniques of formal methods abstraction and modelling. First this book provides a sound, but simple basis of insight into discrete mathematics: numbers, sets, Cartesians, types, functions, the Lambda Calculus, algebras, and mathematical logic. Then it trains its readers in basic property- and model-oriented specification principles and techniques. The model-oriented concepts that are common to such specification languages as B, VDM-SL, and Z are explained here using the RAISE specification language (RSL). This book then covers the basic principles of applicative (functional), imperative, and concurrent (parallel) specification programming. Finally, the volume contains a comprehensive glossary of software engineering, and extensive indexes and references.

These volumes are suitable for self-study by practicing software engineers and for use in university undergraduate and graduate courses on software engineering. Lecturers will be supported with a comprehensive guide to designing modules based on the textbooks, with solutions to many of the exercises presented, and with a complete set of lecture slides.



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Software **Engineering** 1

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