

The main topics of theoretical computer science are taught in most computer science and engineering curricula, but are not presented as a *foundation* for computer studies. Most courses—and their reference textbooks—are highly biased in their choice of topics. Very often they overemphasize traditional areas—such as formal languages and automata—and pay little or no attention to newer important topics—such as formal semantics or computational complexity.

The organization of this book results from our strongly held belief that theoretical computer science should be viewed as the cornerstone of computer science and engineering curricula. Computer specialists, in their everyday life, must be able to translate actual problems into abstractions based on the use of formal models, to manipulate such formal descriptions, and to reason about their properties in a rigorous way. This very special attitude differentiates the computer specialist from most other technical professionals.

For these reasons, we suggest that an exposure to theoretical computer science topics should be given in the early stage of computer science education, particularly at the undergraduate level. Theoretical topics *should not* be viewed as options that can be added late in the curricula. Rather, they must be viewed as