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Mathematics for applied sciences. (Mathematik für angewandte Wissenschaften.)

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This textbook is intended for students of applied sciences. It introduces the prospective reader to numerous mathematical settings that are employed to exhibit connections between different mathematical subjects and to derive solution methods for mathematical problems. Emphasis is thereby put on understanding the relevant analysis of mathematical investigations and its applicability to real-world problems. A large number of examples and exercises with solutions allows the student to practice and review the studied material. The authors purports that the understanding of mathematical methodologies and their correct applications allows the student to be successful in completing course requirements. The book at hand lays the foundations for achieving the students' goals. The textbook is divided into sixteen chapters each concluding with an exercise section that highlights and complements the material presented in the preceding chapter. The exercises are chosen from a large variety of applications making them therefore very attractive for students of applied sciences. Solutions and hints to exercises are listed at the end of the book. The material presented in this book covers essentially the spectrum of mathematical subjects that a student of applied sciences encounters during the studies. It also reflects the minimum mathematical knowledge required from students who complete a degree at a university of applied sciences. In particular, the following major mathematical subjects are treated in this volume: linear algebra (vectors, matrices, linear systems of equations); calculus of one and several real variables; complex numbers and complex functions of one variable; Taylor and Fourier expansions; Fourier and Laplace transforms; ordinary differential equations; probability theory; and descriptive statistics and statistical inference. In summary, this textbook provides students of applied sciences a welcome means to study and, above all, understand mathematics and mathematical modeling.

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