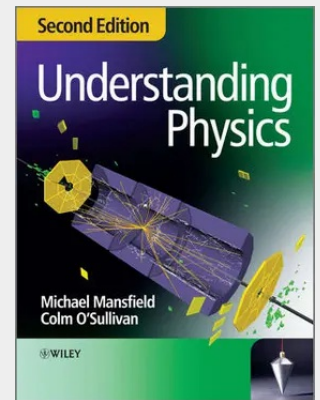


Understanding Physics

Understanding Physics - Second edition is a comprehensive, yet compact, introductory physics textbook aimed at physics undergraduates and also at engineers and other scientists taking a general physics course. Written with today's students in mind, this text covers the core material required by an introductory course in a clear and refreshing way. A second colour is used throughout to enhance learning and understanding. Each topic is introduced from first principles so that the text is suitable for students without a prior background in physics. At the same time the book is designed to enable students to proceed easily to subsequent courses in physics and may be used to support such courses. Mathematical methods (in particular, calculus and vector analysis) are introduced within the text as the need arises and are presented in the context of the physical problems which they are used to analyse. Particular aims of the book are to demonstrate to students that the easiest, most concise and least ambiguous way to express and describe phenomena in physics is by using the language of mathematics and that, at this level, the total amount of mathematics required is neither large nor particularly demanding. 'Modern physics' topics (relativity and quantum mechanics) are introduced at an earlier stage than is usually found in introductory textbooks and are integrated with the more 'classical' material from which they have evolved. This book encourages students to develop an intuition for relativistic and quantum concepts at as early a stage as is practicable. The text takes a reflective approach towards the scientific method at all stages and, in keeping with the title of the text, emphasis is placed on understanding of, and insight into, the material presented.

The physical universe has always been of great interest to mankind, and as we continue to develop an understanding of the world around us, there will always be a single set of rules that have come to be called Laws of Nature, which explain the behaviour of our physical environment. With this in mind, this second edition of Understanding Physics introduces 20th Century topics at an earlier stage than is usually found in introductory textbooks and these are integrated with more 'classical' material from which they have evolved. Understanding Physics emphasizes, in a fully rigorous manner, the essential unity of physics. In twenty-two chapters all fundamental concepts of physics, from classical building towards more specialised subjects, are presented. Among the many topics covered are: * Dynamics * Force fields * Relative Motion and Special Relativity * Thermal physics * Introduction to quantum mechanics * Electric Currents and Fields * Optics * Atom Physics * Nuclear physics, particle physics and astrophysics Throughout the text references are given to sources where more detailed discussions of particular topics or applications may be found, and worked examples and problems are presented at the end of each chapter. Understanding Physics is written primarily for students who are taking their first course in physics at university level. While it is anticipated that many readers will have some previous knowledge of physics or of general science, each topic is introduced from first principles so that the text is suitable for students without any prior background in physics. Additional web material for instructors and students can be found at www.wiley.com/go/mansfield Reviews of the first edition "It is well written, well illustrated and has a fresh approach." --Professor Malcolm Cooper, University of Warwick, UK "In my opinion this is an excellent text. It is well balanced, it is explanatory and it has an interesting integrated structure." --Dr Leif Karlsson, Uppsala University, Sweden



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