

Preface

The book at hand has developed from the lecture notes used in the teaching of the Special Theory of Relativity for many years by the author, originally to engineering students and finally to students of Physics and Mathematics at the School of Mathematical and Physical Sciences of the National Technical University of Athens. About half the material contained in the book was covered in 25 hourly lectures during the second semester of the first year of studies.

As a textbook, the book has some special characteristics: The proofs of the theorems are given in adequate detail, many figures are used, many examples are used for the comprehension of the theory and many problems are suggested for solution by the reader. The detailed solutions of all the problems are given at the end of the book. However, it must be understood that, for maximum benefit, the reader should really try to solve a problem before resorting to the solution given. As assistance in this direction, the answers to all the problems are given, as well as appropriate hints or suggestions on how to solve the problems.

Special attention has been paid to presenting the historical approach of Physics to the Special Theory of Relativity, to its experimental foundation and to the experiments performed in order to test the validity of the theory. For this reason, a large number of experiments are described in detail.

The Special Theory of Relativity found applications in a large number of problems, mainly in Physics, and an attempt is made to present the most important of them, which every physicist should be familiar with. Many of the applications are developed in the Examples and Problems and the reader should pay particular attention to them.

In order that the reader should take advantage of the ease of access to the scientific literature made possible by today's technology, references are given to the original articles and review articles concerning each topic.

The book gives a fairly complete presentation of the Special Theory of Relativity for a first approach to the subject at the undergraduate university level. A basic course on the Special Theory of Relativity could consist of Chaps. 2, 3, 6 and 9, supplemented by appropriate applications of the theory from Chaps. 4, 5 and 7.

Additional, more demanding topics may be found in the rest of the chapters and in the appendices. The mathematics needed is that of the first year of a degree in Physics. Whenever necessary, a brief presentation of additional mathematics is given in the text.

It is hoped that the book will be a useful addition to the existing literature on this fascinating subject.

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