

INTRODUCTION TO **GENERAL PHYSICS**

BOOK 1



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FORWARD

It is generally agreed that the first year University undergraduate physics courses can be challenging to students, particularly students in the life sciences who do not have to do physics beyond their first year. This book 'Introduction to General Physics' well deserved effect that would lead student to a thorough understanding of the basic concepts organised to assist them in reading, comprehension of first year university undergraduate physics topics in Mechanics, such as, Space and Time, Units, Dimension and Errors of Measurements, Vectors, Particle Kinematics and Projectiles, Force and Motion, Motion along a Curved Path, Work, Energy and Power, Gravitation and Machine; Properties of Matter, such as, Fluid statics and dynamics, Elasticity; and also, Thermal physics, such as, Temperature and Thermometry, Thermal Expansion, Measurement of Heat Energy, Mechanism of Heat Transfer, Thermodynamics and Kinetic theory of gases.

The book attempts to make the topics easy for understanding and comprehension by providing easy-to-work examples with solutions provided.

The Exercises provided at the end of each chapter is good enough to equip serious students to excel.

It is my joy that the book in its present form is going to fill a gap in the study of physics and knowledge acquisition by first year university students in topics, such as, Mechanics, such as, Space and Time, Units, Dimension and Errors of Measurements, Vectors, Particle Kinematics and Projectiles, Force and Motion, Motion along a Curved Path, Work, Energy and Power, Gravitation and Machine; Properties of Matter, such as, Fluid statics and dynamics, Elasticity; and also, Thermal physics, such as, Temperature and Thermometry, Thermal Expansion, Measurement of Heat Energy, Mechanism of Heat Transfer, Thermodynamics and Kinetic theory of gases.

This is a good and commendable effort on the part of the authors to bridge that knowledge gap identified.

Professor Oluwasesan A. Falaiye

PREFACE

This textbook has been designed for the General Physics course especially for non-majors of Physics in Nigerian Universities, Polytechnics and Colleges of Education. It may however, serve as a quick-reference for basic concepts in Physics by other users. The authors, from years of experience teaching the course, have recognized the need to have such book written to meet these specific needs.

The areas covered in this book include Mechanics, such as, Space and Time, Units, Dimension and Errors of Measurements, Vectors, Particle Kinematics and Projectiles, Force and Motion, Motion along a Curved Path, Work, Energy and Power, Gravitation and Machine; Properties of Matter, such as, Fluid statics and dynamics, Elasticity; and also, Thermal physics, such as, Temperature and Thermometry, Thermal Expansion, Measurement of Heat Energy, Mechanism of Heat Transfer, Thermodynamics and Kinetic theory of gases. This book has been written in simple English to ease understanding and unnecessary mathematical derivations have been excluded. Worked examples have been included to show the application of concepts in solving some physical problems. Self-evaluation exercises are also included so that users may reinforce their understanding of concepts learnt in the preceding chapter.

It is believed that this book will be of immense benefit to the users.

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About the Book

The General Physics Book 1 is a basic text for non-major students in the field of sciences. The book covers the fundamentals of physics. It is a useful resource for study and teaching of the 100L physics.

The book contains twenty-one (21) Chapters for a full semester work. Each chapter begins with an introduction / definition and the topics were presented as simple as possible, and in a clear language of assimilation and retention, in detailed and self-contained manner, with little or no prior knowledge assumed. There are many solved examples to guide students. Many exercises were also presented at the end of each chapter, which, finding their solutions, will enhance the understanding of the underlying knowledge acquired. Basic Mathematical formulae, Conversion factors, Fundamental constants of physics, Astronomical data and Solar system constants and Greek Alphabets are provided in the appendices.

The book is written by seasoned higher institution teachers, who have used their wealth of experience in teaching at different levels of learning centres, such as, University, Polytechnics, College of Education, A-Level Colleges, but to mention a few, to write this invaluable text.