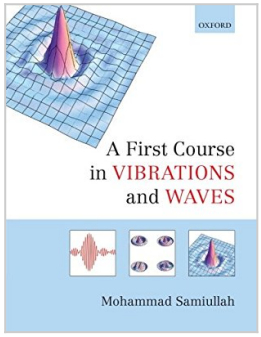

A First Course in Vibrations and Waves

By Mohammad Samiullah

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The study of vibrations and waves is central to physics and engineering disciplines.This text contains a detailed treatment of vibrations and waves at an introductory level suitable for second and third year students. It builds on first year physics and emphasizes understanding of vibratory motion and waves based on first principles. Since waves appear in almost all branches of physics and engineering, readers will be exposed to many different types of waves; this study aims to draw together their similarities, by examining them in a common language.

The book is divided into three parts: Part I contains a preliminary chapter that serves as a review of relevant ideas of mechanics and complex numbers. Part II is devoted to a detailed discussion of vibrations of mechanical systems. This part covers simple harmonic oscillator, coupled oscillators, normal coordinates, beaded string, continuous string, and Fourier series. It concludes with a presentation of stationary solutions of driven finite systems. Part III is concerned with waves, focusing on the discussion of common aspects of all types of waves, and the applications to sound, electromagnetic, and matter waves are illustrated. Finally, relevant examples are provided at the end of the chapters to illustrate the main ideas, and better the reader's understanding.

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Editorial Review

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Professor Mohammad Samiullah has taught introductory and advanced physics for 22 years at Truman State University, USA, where he is currently Professor of Physics. He has two Ph.D.'s from Boston University, USA, one in Chemistry and the other in Physics. He was a Research Fellow at the Indian Institute of Science, Bangalore before joining Truman. He also has a Master's degree from the Indian Institute of Technology, Kanpur. Professor Samiullah has considerable experience with research in Physics Education and has published on collaborative learning methods in physics teaching. He was awarded a Truman Fellow and a Jepson Fellow at Truman State that recognized innovative teaching methods. His research contributions in physics have spanned from Quantum Field Theory to Solid State Physics and Nonlinear Optics.

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