cation in materials science and semiconductor research.

This book is intended to be used as a textbook for material science students studying the theory, operation, and application of the TEM. It is truly a book so thoughtfully written that it can be read and understood by students, and it will provide a solid foundation for those studying material science. It is richly illustrated with full-color figures and illustrations throughout the text. There are extensive questions at the end of each chapter, approximately 800 questions for self-assessment and over 400 that are suitable for homework assignments. Although the authors may have a focus on classroom instruction, this book is not simply a book on TEM theory. It also contains many practical methods for sample preparation, equipment maintenance, and many other areas. It can be used to determine which experimental TEM technique should be used and how to implement that particular technique.

There are four parts. Part 1 covers the basic fundamentals of the microscope operation and the physics behind the TEM (scattering, diffraction, electron sources, lenses, pumps, the instrument itself, and specimen preparation). Part 2 details diffraction beams and beam techniques used under various types of situations. Part 3 describes the factors that control the image that you see with the TEM and ways to improve images. Some of the content covers amplitude contrast, phase-contrast images, bending effects, planar defects, strain fields, high-resolution TEMs, weak-beam dark-field, image simulation, and image processing techniques. The final part covers the fundamentals of spectroscopy used in TEMs and other microscopes. Some of the methods included are X-ray spectroscopy and analysis, electron-energy loss spectroscopy (EELS), low-loss and high energy-loss spectra and images, and fine structure.

There are an abundant number of references at the end of each chapter for further study to ensure broad coverage and to cover more in-depth details. This is an outstanding book for an advanced undergraduate or graduate course in material science, and even those already working in the materials science field would find this book to be a convenient resource to help guide their choice of TEM analysis.

Harris' Shock and Vibration Handbook, 63th edition

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Shock and vibration properties are very important in many applications such as automobile engines, motors, rotating machinery, military equipment, computer hard drives, and automobile safety. The mechanical integrity and life of materials and components depend on their design and intended application. Many devices must be able to sustain varying levels of shock (impact) and vibration over their expected lifetimes. Monitoring of vibration levels can also be used as a diagnostic tool for predicting failure and allowing preventative maintenance before an unplanned failure results.

This handbook provides practical guidance to engineers and scientists working on problems involving shock and vibration. It is a comprehensive resource of information on the basic theory of shock and vibration and provides information on the design, analysis, installation, and maintenance of systems subjected to mechanical shock and vibration and practical up-to-date information on instrumentation, measurement techniques, testing, control methods, and practical applications.

The book contains five major parts, with each part dealing with a different aspect of shock and vibration. The first part covers the fundamentals of shock and vibration, including theory on free and forced vibrations, ridged bodies, nonlinear vibration, and various system response conditions. The second part addresses instrumentation for the measurement of shock and vibration, discussing various types of transducers, transducer calibration, amplifiers and circuit noise reduction, and mechanical vibration monitoring for precursor end-of-life diagnostics. The third part covers test criteria and data analysis, various standards, methods used to analyze waveforms from measurements, and the interpretation of those results and methods for relating these measurements to the dynamic characteristics of structures. The forth part involves testing machines and procedures. The last part deals with specialized applications including torsional vibration of internal combustion engines and rotating machines, shock isolators, and the effects of shock and vibration on humans.

This book would be useful to anyone who uses transducers (acceleration, velocity, or displacement types) to measure shock or vibration. This up-to-date handbook is loaded with essential theory for understanding what is happening, along with excellent practical knowledge from experts in this field on how to acquire and analyze signals.

Principles of Terahertz Science and Technology

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Terahertz (THz) radiation represents the electromagnetic waves that lie between radio waves and infrared waves in the electromagnetic spectrum. Until lately, this "gap" in the spectrum has not been heavily researched due to a lack of generation, detection methods, and practical interest. Now, however, over the past two decades, an increasing amount of research on THz waves has produced improved generation and detection methods. This has lead to new practical applications in molecular spectroscopy, security imaging, high-speed communications, and medical diagnosis.

This book contains a wide range of topics and fundamental issues on THz technology. Major techniques for generating, detecting, and manipulating these waves are covered along with the interaction of THz waves with chemical, physi-