Theory Of Viscoelasticity Second Edition R M Christensen

A valuable research tool in continuum mechanics for more that 50 years, this highly regarded engineering manual focuses on three important aspects of elasticity theory: finite elastic deformations, complex variable methods for two-dimensional problems for both isotropic and aeolotropic bodies, and shell theory. Additional topics include three-dimensional problems for isotropic and transversely isotropic bodies.

Theory of ViscoelasticitySecond EditionCourier Corporation

DIVPioneering presentation of basic theory, experimental methods and results, solution of boundary value problems. Six appendices. Updated bibliography. /div

Theory of Viscoelasticity: An Introduction, Second Edition discusses the integral form of stress strain constitutive relations. The book presents the formulation of the boundary value problem and demonstrates the separation of variables condition. The text describes the mathematical framework to predict material behavior. It discusses the problems to which integral transform methods do not apply. Another topic of interest is the thermoviscoelastic stress analysis. The section that follows describes the heat conduction, glass transition criterion, viscoelastic Rayleigh waves, optimal strain history path, and nonlinear behavior of elastomers. The book will provide valuable insights for chemists, engineers, students, and researchers in the field of chemistry.

Creep and Fatigue in Polymer Matrix Composites, Second Edition, updates the latest research in modeling and predicting creep and fatigue in polymer matrix composites. The first part of the book reviews the modeling of viscoelastic and viscoplastic behavior as a way of predicting performance and service life. Final sections discuss techniques for modeling creep rupture and failure and how to test and predict long-term creep and fatigue in polymer matrix composites. Reviews the latest research in modeling and predicting creep and fatigue in polymer matrix composites Puts a specific focus on viscoelastic and viscoplastic modeling Features the time-temperature-age superposition principle for predicting long-term response Examines the creep rupture and damage interaction, with a particular focus on time-dependent failure criteria for the lifetime prediction of polymer matrix composite structures that are illustrated using experimental cases

Theoretical Elasticity

Mechanics of Composite Materials

An Introduction to Mathematical Models

An Introduction to the Mechanical Properties of Solid Polymers

Creep and Fatigue in Polymer Matrix Composites

This compact volume equips the reader with all the facts and principles

essential to a fundamental understanding of the theory of probability. It is an introduction, no more: throughout the book the authors discuss the theory of probability for situations having only a finite number of possibilities, and the mathematics employed is held to the elementary level. But within its purposely restricted range it is extremely thorough, well organized, and absolutely authoritative. It is the only English translation of the latest revised Russian edition; and it is the only current translation on the market that has been checked and approved by Gnedenko himself. After explaining in simple terms the meaning of the concept of probability and the means by which an event is declared to be in practice, impossible, the authors take up the processes involved in the calculation of probabilities. They survey the rules for addition and multiplication of probabilities, the concept of conditional probability, the formula for total probability, Bayes's formula, Bernoulli's scheme and theorem, the concepts of random variables, insufficiency of the mean value for the characterization of a random variable, methods of measuring the variance of a random variable, theorems on the standard deviation, the Chebyshev inequality, normal laws of distribution, distribution curves, properties of normal distribution curves, and related topics. The book is unique in that, while there are several high school and college textbooks available on this subject, there is no other popular treatment for the layman that contains quite the same material presented with the same degree of clarity and authenticity. Anyone who desires a fundamental grasp of this increasingly important subject cannot do better than to start with this book. New preface for Dover edition by B. V. Gnedenko.

Integration of theoretical developments offers complete description of linear theory of viscoelastic behavior of materials, with theoretical formulations derived from continuum mechanics viewpoint and discussions of problem solving. 1982 edition.

Exploration of stochastic control

theory in terms of analysis, parametric optimization, and optimal stochastic control. Limited to linear systems with quadratic criteria; covers discrete time and continuous time systems. 1970 edition.
Semi-technical account includes a review of classical physics (origin of space and time measurements, Ptolemaic and Copernican astronomy, laws of motion, inertia, more) and of Einstein's theories of relativity.
This book provides a unified mechanics and materials perspective on polymers: both the mathematics of viscoelasticity theory as well as the physical mechanisms behind polymer deformation processes. Introductory material on fundamental mechanics is included to provide a continuous baseline for readers from all disciplines. Introductory material on the chemical and molecular basis of polymers is also included, which is essential to the understanding of the thermomechanical response. This self-contained text covers the viscoelastic characterization of polymers including constitutive modeling, experimental

methods, thermal response, and stress and failure analysis. Example problems are provided within the text as well as at the end of each chapter. New to this edition: · One new chapter on the use of nano-material inclusions for structural polymer applications and applications such as fiber-reinforced polymers and adhesively bonded structures · Brings up-to-date polymer production and sales data and equipment and procedures for evaluating polymer characterization and classification · The work serves as a comprehensive reference for advanced seniors seeking graduate level courses, first and second year graduate students, and practicing engineers

An Introduction to Generalized Functions, with Applications

Second Edition

The Theory of Linear Viscoelasticity

Fluid Dynamics of Viscoelastic Liquids

Group Theory

The aim of Plasticity Theory is to provide a comprehensive introduction to the contemporary state of knowledge in basic plasticity theory and to its applications. It treats several areas not commonly found between the covers of a single book: the physics of plasticity, constitutive theory, dynamic plasticity, large-deformation plasticity, and numerical methods, in addition to a representative survey of problems treated by classical methods, such as elastic-plastic problems, plane plastic flow, and limit analysis; the problem discussed come from areas of interest to mechanical, structural, and geotechnical engineers, metallurgists and others. The necessary mathematics and basic mechanics and thermodynamics are covered in an introductory chapter, making the book a self-contained text suitable for advanced undergraduates and graduate students, as well as a reference for practitioners of solid mechanics.

Here is clear, well-organized coverage of the most standard theorems, including isomorphism theorems, transformations and subgroups, direct sums, abelian groups, and more. This undergraduate-level text features more than 500 exercises.

The new edition includes additional analytical methods in the classical theory of viscoelasticity. This leads to a new theory of finite linear viscoelasticity of incompressible isotropic materials. Anisotropic viscoplasticity is completely reformulated and extended to a general constitutive theory that covers crystal plasticity as a special case.

This monograph provides a comprehensive overview of the author's work on the fields of fractional calculus and waves in linear viscoelastic media, which includes his pioneering contributions on the applications of special functions of the Mittag-Leffler and Wright types. It is intended to serve as a general introduction to the above-mentioned areas of mathematical modeling. The explanations in the book are detailed enough to capture the interest of the curious reader, and complete enough to provide the necessary background material needed to delve further into the subject and explore the research literature given in the huge general bibliography. This book is likely to be of interest to applied scientists and engineers.

This book contains notes for a one-semester course on viscoelasticity given in the Division of Applied Mathematics at Brown University. The course serves as an introduction to viscoelasticity and as a workout in the use of various standard mathematical methods. The reader will soon find that he needs to do some work on the side to fill in details that are omitted from the text. These are notes, not a completely de tailed explanation. Furthermore, much of the content of the course is in the prob lems assigned for solution by the student. The reader who does not at least try to solve a good many of the problems is likely to miss most of the point. Much that is known about viscoelasticity is not discussed in these notes, and references to original sources are usually not given, so it will be difficult or impossible to use this book as a reference for looking things up. Readers wanting something more like a treatise should see Ferry's Viscoelastic Properties of Polymers, Lodge's Elastic Liquids, the volumes edited by Eirich on Rheology, or any issue of the Transactions of the Society of Rheology. These works emphasize physical aspects of the subject. On the mathematical side, Gurtin and Sternberg's long paper On the Linear Theory of Viscoelasticity (ARMA~, 291(1962)) remains the best reference for proofs of theorems.

Introduction to Graph Theory

Polymer Engineering Science and Viscoelasticity

Polymer Viscoelasticity

Elementary Number Theory

From Hydraulics to Plasticity

A rigorous self-contained exposition of the mathematical theory for wave propagation and general ray theory in layered viscoelastic media.

A revised molecular approach to a classic on viscoelasticbehavior Because viscoelasticity affects the properties, appearance,processing, and performance of polymers such as rubber, plastic,and adhesives, a proper utilization of such polymers requires aclear understanding of viscoelastic behavior. Now in its third edition, Introduction to Polymer Viscoelasticityremains a classic in the literature of molecular viscoelasticity,bridging the gap between primers on polymer science and advancedresearch-level monographs. Assuming a molecular, rather than amechanical approach, the text provides a strong grounding in thefundamental concepts, detailed derivations, and particularattention to assumptions, simplifications, and limitations. This Third Edition has been entirely revised and updated to reflectrecent developments in the field. New chapters include: * Phenomenological Treatment of Viscoelasticity * Viscoelastic Models * Time-Temperature Correspondence * Transitions and Relaxation in Polymers * Elasticity of Rubbery Networks * Dielectric and NMR Methods With detailed explanations, corresponding equations, andexperimental methods, supported by real-life applications (as wellas the inclusion of a CD-ROM with data to support the exercises),this Third Edition provides today's students and professionals withthe tools they need to create polymers with more desirablequalities than ever. Designing structures using composite materials poses unique challenges, especially due to the need for concurrent design of both material and structure. Students are faced with two options: textbooks that teach the theory of advanced mechanics of composites, but lack computational examples of advanced analysis, and books on finite element analysis that may or may not demonstrate very limited applications to composites. But there is a third option that makes the other two obsolete: Ever J. Barbero's Finite Element Analysis of Composite Materials Using ANSYS®, Second Edition. The Only Finite Element Analysis Book on the Market Using ANSYS to Analyze Composite Materials. By layering detailed theoretical and conceptual discussions with fully developed examples, this text supplies the missing link between theory and implementation. In-depth discussions cover all of the major aspects of advanced analysis, including three-dimensional effects, viscoelasticity, edge effects, elastic instability, damage, and delamination. This second edition of the bestseller has been completely revised to incorporate advances in the state of the art in such areas as modeling of damage in composites. In addition, all 50+ worked examples have been updated to reflect the newest version of ANSYS. Including some use of MATLAB®, these examples demonstrate how to use the concepts to formulate and execute finite element analyses and how to interpret the results in engineering terms. Additionally, the source code for each example is available to students for download online via a companion website featuring a special area reserved for instructors. Plus a solutions manual is available for qualifying course adoptions. Cementing applied computational and analytical experience to a firm foundation of basic concepts and theory, Finite Element Analysis of Composite Materials Using ANSYS, Second Edition offers a modern, practical, and versatile classroom tool for today's engineering classroom.

The second edition provides an update of the recent developments in classical and computational solid mechanics. The structure of the book is also updated to include five new areas: Fundamental Principles of Thermodynamics and Coupled Thermoelastic Constitutive Equations at Large Deformations, Functional Thermodynamics and Thermoviscoelasticity, Thermodynamics with Internal State Variables and Thermo-Elasto-Viscoplasticity, Electro-Thermo-Viscoelasticity/Viscoplasticity, and Meshless Method. These new topics are added as self-contained sections or chapters. Many books in the market do not cover these topics. This invaluable book has been written for engineers and engineering scientists in a style that is readable, precise, concise, and practical. It gives the first priority to the formulation of problems, presenting the classical results as the gold standard, and the numerical approach as a tool for obtaining solutions. Request

Inspection Copy

This outstanding text is written in clear language and enhanced with many exercises, diagrams, and proofs. It discusses historical developments and future directions and provides an extensive bibliography and references. 1971 edition.

Viscoelasticity

First Concepts and Distributive Lattices

Einstein's Theory of Relativity

Distribution Theory and Transform Analysis

Theory of Relativity

This undergraduate text develops its subject through observations of the physical world, covering finite sets, cardinal numbers, infinite cardinals, and ordinals. Includes exercises with answers. 1958 edition.

This comprehensive introduction to the many-body theory was written by three renowned physicists and acclaimed by American Scientist as "a classic text on field theoretic methods in statistical physics."

Nobel Laureate's brilliant early treatise on Einstein's theory consists of his original 1921 text plus retrospective comments 35 years later. Concise and comprehensive, it pays special attention to unified field theories.

Viscoelastic behavior reflects the combined viscous and elastic responses, under mechanical stress, of materials which are intermediate between liquids and solids in character. Polymers the basic materials of the rubber and plastic industries and important to the textile, petroleum, automobile, paper, and pharmaceutical industries as well exhibit viscoelasticity to a pronounced degree. Their viscoelastic properties determine the mechanical performance of the final products of these industries, and also the success of processing methods at intermediate stages of production. Viscoelastic Properties of Polymers examines, in detail, the effects of the many variables on which the basic viscoelastic properties depend. These include temperature, pressure, and time; polymer chemical composition, molecular weight and weight distribution, branching and crystallinity; dilution with solvents or plasticizers; and mixture with other materials to form composite systems. With guidance by molecular theory, the dependence of viscoelastic properties on these variables can be simplified by introducing certain ancillary concepts such as the fractional free volume, the monomeric friction coefficient, and the spacing between entanglement loci, to provide a qualitative understanding and in many cases a quantitative prediction of how to achieve desired results. The phenomenological theory of viscoelasticity which permits interrelation of the results of different types of experiments is presented first, with many useful approximation procedures for calculations given. A wide variety of experimental methods is then described, with critical evaluation of their applicability to polymeric materials of different consistencies and in different regions of the time scale (or, for oscillating deformations, the frequency scale). A review of the present state of molecular theory follows, so that viscoelasticity can be related to the motions of flexible polymer molecules and their entanglements and network junctions. The dependence of viscoestic properties on temperature and pressure, and its descriptions using reduced variables, are discussed in detail. Several chapters are then devoted to the dependence of viscoelastic properties on chemical composition, molecular weight, presence of diluents, and other features, for several characteristic classes of polymer materials.

Finally, a few examples are given to illustrate the many potential applications of these principles to practical problems in the processing and use of rubbers, plastics, and fibers, and in the control of vibration and noise. The third edition has been brought up to date to reflect the important developments, in a decade of exceptionally active research, which have led to a wider use of polymers, and a wider recognition of the importance and range of application of viscoelastic properties. Additional data have been incorporated, and the book s chapters on dilute solutions, theory of undiluted polymers, plateau and terminal zones, cross-linked polymers, and concentrated solutions have been extensively rewritten to take into account new theories and new experimental results. Technical managers and research workers in the wide range of industries in which polymers play an important role will find that the book provides basic information for practical applications, and graduate students in chemistry and engineering will find, in its illustrations with real data and real numbers, an accessible introduction to the principles of viscoelasticity.

This volume addresses aspects and applications of the quantum theory of scattering in atomic and nuclear collisions. An encyclopedic source of pioneering work, it serves as a self-contained text and reference for students and professionals in the fields of chemistry, physics, and astrophysics. Numerous graphs, tables, footnotes, appendices, and bibliographies. 1962 edition.

An Elementary Introduction to the Theory of Probability

Plasticity Theory

Lectures on Viscoelasticity Theory

Theory of Functions, Parts I and II

Fractional Calculus and Waves in Linear Viscoelasticity

This book covers in great detail the Rouse-segment-based

molecular theories in polymer viscoelasticity ? the Rouse theory and the extended reptation theory (based on the framework of the Doi?Edwards theory) ? that have been shown to explain experimental results in a consistently quantitative way. The explanation for the 3.4 power law of viscosity, quantitative line-shape analyses of viscoelastic responses and agreements between different sorts of viscoelastic responses, the consistency between the viscoelasticity and diffusion results, the clarification of the onset of entangelement, the discovery of the number of entanglement strands per cubed entanglement distance being a universal constant and the basic mechanism of the glass transition-related thermorheological complexity are discussed or shown in great detail. The mystery behind the success of the Rouse-segment-based molecular theories over the entropic region of a viscoelastic response is revealed by the Monte Carlo simulations on the Fraenkel chains. Specifically, the simulation studies give a natural explanation for the coexistence of the energy-driven and entropy-driven modes in a viscoelastic response and provide a theoretical basis resolving the paradox that the experimentally determined sizes of Rouse and Kuhn segments are nearly the same. This book starts from a very fundamental level; each chapter is built upon the contents of the previous chapters. Thus, the readers may use the book as a textbook and eventually reach an advanced research level. This book is also a useful source of reference for physicists, chemists and material scientists.

This book is about two special topics in rheological fluid mechanics: the elasticity of liquids and asymptotic theories of constitutive models. The major emphasis of the book is on the mathematical and physical consequences of the elasticity of liquids; seventeen of twenty chapters are devoted to this. Constitutive models which are instantaneously elastic can lead to some hyperbolicity in the dynamics of flow, waves of vorticity into rest (known as shear waves), to shock waves of vorticity or

velocity, to steady flows of transonic type or to short wave instabilities which lead to ill-posed problems. Other kinds of models, with small Newtonian viscosities, give rise to perturbed instantaneous elasticity, associated with smoothing of discontinuities as in gas dynamics. There is no doubt that liquids will respond like elastic solids to impulses which are very rapid compared to the time it takes for the molecular order associated with short range forces in the liquid, to relax. After this, all liquids look viscous with signals propagating by diffusion rather than by waves. For small molecules this time of relaxation is estimated as lQ-13 to 10-10 seconds depending on the fluids. Waves associated with such liquids move with speeds of 1 QS cm/s, or even faster. For engineering applications the instantaneous elasticity of these fluids is of little interest; the practical dynamics is governed by diffusion, ·say, by the Navier-Stokes equations. On the other hand, there are other liquids which are known to have much longer times of relaxation.
Undergraduate text offers an analysis of deformation and stress, covers laws of conservation of mass, momentum, and energy, and surveys the formulation of mechanical constitutive equations. 1992 edition.
Distribution theory, a relatively recent mathematical approach to classical Fourier analysis, not only opened up new areas of research but also helped promote the development of such mathematical disciplines as ordinary and partial differential equations, operational calculus, transformation theory, and functional analysis. This text was one of the first to give a clear explanation of distribution theory; it combines the theory effectively with extensive practical applications to science and engineering problems. Based on a graduate course given at the State University of New York at Stony Brook, this book has two objectives: to provide a comparatively elementary introduction to distribution theory and to describe the generalized Fourier and Laplace transformations and their applications to

integrodifferential equations, difference equations, and passive systems. After an introductory chapter defining distributions and the operations that apply to them, Chapter 2 considers the calculus of distributions, especially limits, differentiation, integrations, and the interchange of limiting processes. Some deeper properties of distributions, such as their local character as derivatives of continuous functions, are given in Chapter 3. Chapter 4 introduces the distributions of slow growth, which arise naturally in the generalization of the Fourier transformation. Chapters 5 and 6 cover the convolution process and its use in representing differential and difference equations. The distributional Fourier and Laplace transformations are developed in Chapters 7 and 8, and the latter transformation is applied in Chapter 9 to obtain an operational calculus for the solution of differential and difference equations of the initial-condition type. Some of the previous theory is applied in Chapter 10 to a discussion of the fundamental properties of certain physical systems, while Chapter 11 ends the book with a consideration of periodic distributions. Suitable for a graduate course for engineering and science students or for a senior-level undergraduate course for mathematics majors, this book presumes a knowledge of advanced calculus and the standard theorems on the interchange of limit processes. A broad spectrum of problems has been included to satisfy the diverse needs of various types of students.

This second edition extends the rigorous, self-contained exposition of the theory for viscoelastic wave propagation in layered media to include head waves and general ray theory. The theory, not published elsewhere, provides solutions for fundamental wave-propagation and ray-theory problems valid for any media with a linear response, elastic or anelastic. It explains measurable variations in wave speed, particle motion, and attenuation of body waves, surface waves, and head waves induced at anelastic material boundaries that do not occur for

elastic waves. This book may be used as a textbook for advanced university courses and as a research reference in seismology, exploration geophysics, engineering, solid mechanics, and acoustics. It provides computation steps for ray-tracing computer algorithms to develop a variety of tomography inferred anelastic models, such as those for the Earth's deep interior and petroleum reserves. Numerical results and problem sets emphasize important aspects of the theory for each chapter.

Continuum Mechanics and Theory of Materials

An Introduction

Introduction to the Theory of Sets

Introduction to Stochastic Control Theory

Continuum Mechanics through the Ages - From the Renaissance to the Twentieth Century

Mixing scientific, historic and socio-economic vision, this unique book complements two previously published volumes on the history of continuum mechanics from this distinguished author. In this volume, Gérard A. Maugin looks at the period from the renaissance to the twentieth century and he includes an appraisal of the ever enduring competition between molecular and continuum modelling views. Chapters trace early works in hydraulics and fluid mechanics not covered in the other volumes and the author investigates experimental approaches, essentially before the introduction of a true concept of stress tensor. The treatment of such topics as the viscoelasticity of solids

and plasticity, fracture theory, and the role of geometry as a cornerstone of the field, are all explored. Readers will find a kind of socio-historical appraisal of the seminal contributions by our direct masters in the second half of the twentieth century. The analysis of the teaching and research texts by Duhem, Poincaré and Hilbert on continuum mechanics is key: these provide the most valuable documentary basis on which a revival of continuum mechanics and its formalization were offered in the late twentieth century. Altogether, the three volumes offer a generous conspectus of the developments of continuum mechanics between the sixteenth century and the dawn of the twenty-first century. Mechanical engineers, applied mathematicians and physicists alike will all be interested in this work which appeals to all curious scientists for whom continuum mechanics as a vividly evolving science still has its own mysteries. This concise introduction to the concepts of viscoelasticity focuses on stress analysis. Three detailed sections present examples of stress-related problems, including sinusoidal oscillation problems, quasi-static problems, and dynamic problems. 1960 edition.

Handy one-volume edition. Part I considers general foundations of theory of functions;

Part II stresses special and characteristic functions. Proofs given in detail. Introduction. Bibliographies.

Provides a comprehensive introduction to the mechanical behaviour of solid polymers. Extensively revised and updated throughout, the second edition now includes new material on mechanical relaxations and anisotropy, composites modelling, non-linear viscoelasticity, yield behaviour and fracture of tough polymers. The accessible approach of the book has been retained with each chapter designed to be self contained and the theory and applications of the subject carefully introduced where appropriate. The latest developments in the field are included alongside worked examples, mathematical appendices and an extensive reference. Fully revised and updated throughout to include all the latest developments in the field Worked examples at the end of the chapter An invaluable resource for students of materials science, chemistry, physics or engineering studying polymer science

Graduate-level text assembles and interprets contributions to field of composite materials for a comprehensive account of mechanical behavior of heterogeneous media. Subjects include macroscopic stiffness properties and failure characterization. 1979 edition.

Set Theory and Logic
Finite Element Analysis of Composite Materials Using ANSYS®, Second Edition
Methods of Quantum Field Theory in Statistical Physics

Quantum Theory of Scattering

Landmark lectures (1909) by Nobel Prize winner deal with application of quantum hypothesis to blackbody radiation, principle of least action, relativity theory, and more. 1915 edition.

Written in a lively, engaging style by the author of popular mathematics books, this volume features nearly 1,000 imaginative exercises and problems. Some solutions included. 1978 edition.

Mises' classic avoids the formidable mathematical structure of fluid dynamics, while conveying — by often unorthodox methods — a full understanding of the physical phenomena and mathematical concepts of aeronautical engineering.

No mathematical theory can completely describe the complex world around us. Every theory is aimed at a certain class of phenomena, formulates their essential features, and disregards what is of minor importance. The theory meets its limits of applicability where a dis regarded influence becomes important. Thus, rigid-

body dynamics describes in many cases the motion of actual bodies with high accu racy, but it fails to produce more than a few general statements in the case of impact, because elastic or anelastic deformation, no matter how local or how small, attains a dominating influence. For a long time mechanics of deformable bodies has been based upon Hooke's law - that is, upon thE" assumption of linear elasticity. It was well known that most engineering materials like metals, con crde, wood, soil, are not linearly elastic or, are so within limits too narrow to cover tne range of pl'actical intcrest. Nevertheless, almost all routine stress analysis is still based on Hooke T s law be cause of its simplicity. In the course of time engineers have become increasingly con scious of the importance of the anelastic behavior of many materials, and mathematical formulations have been attempted and applied to practical problems. Outstanding among them are the theories of ide ally plastic and of viscoelastic materials. While plastic behavior is essentially nonlinear (piecewise linear at best), viscoelasticity, like elasticity, permits a linear theory. This theory of linear visco elasticity is the subject of tbe *present book.*

Aimed at "the mathematically traumatized," this text offers nontechnical coverage of graph theory, with exercises. Discusses planar graphs, Euler's formula, Platonic graphs, coloring, the genus of a graph, Euler walks, Hamilton walks, more. 1976 edition.

Theory of Flight

Classical and Computational Solid Mechanics

Basics, Molecular Theories, Experiments, and Simulations

Introduction to Polymer Viscoelasticity

Eight Lectures on Theoretical Physics

Explores sets and relations, the natural number sequence and its generalization, extension of natural numbers to real numbers, logic, informal axiomatic mathematics, Boolean algebras, informal axiomatic set theory, several algebraic theories, and 1st-order theories.

Viscoelastic Waves and Rays in Layered Media

Lattice Theory

Viscoelastic Properties of Polymers

Theory of Viscoelasticity

Continuum Mechanics