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**Introduction**  
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**Mechanics**  
**Fourth**  
**Edition**  
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*This book*

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*presents an  
introduction to  
the classical  
theories of  
continuum  
mechanics; in  
particular, to  
the theories of  
ideal,  
compressible,  
and viscous  
fluids, and to  
the linear and  
nonlinear*

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*theories of  
elasticity.  
These theories  
are important,  
not only because  
they are  
applicable to a  
majority of the  
problems in  
continuum  
mechanics  
arising in  
practice, but  
because they*

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*form a solid  
base upon which  
one can readily  
construct more  
complex theories  
of material  
behavior.*

*Further,  
although  
attention is  
limited to the  
classical  
theories, the  
treatment is*

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*modern with a  
major emphasis  
on foundations  
and structure  
Now in its fully  
updated fourth  
edition, this  
leading text in  
its field is an  
exhaustive  
monograph on  
turbulence in  
fluids in its  
theoretical and*

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*applied aspects. The authors examine a number of advanced developments using mathematical spectral methods, direct-numerical simulations, and large-eddy simulations. The book remains a*

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*hugely important contribution to the literature on a topic of great importance for engineering and environmental applications, and presents a very detailed presentation of the field.*

*This publication*  
*Page 7/207*

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*is aimed at  
students,  
teachers, and  
researchers of  
Continuum  
Mechanics and  
focused  
extensively on  
stating and  
developing  
Initial Boundary  
Value equations  
used to solve  
physical*



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*problems. With respect to notation, the tensorial, indicial and Voigt notations have been used indiscriminately. The book is divided into twelve chapters with the following topics: Tensors,*

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Continuum  
Kinematics,  
Stress, The  
Objectivity of  
Tensors, The  
Fundamental  
Equations of  
Continuum  
Mechanics, An  
Introduction to  
Constitutive  
Equations,  
Linear  
Elasticity,

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Hyperelasticity,  
Mechanics Fourth  
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Plasticity  
(small and large  
deformations),  
Thermoelasticity  
(small and large  
deformations),  
Damage Mechanics  
(small and large  
deformations),  
and An  
Introduction to  
Fluids.

Moreover, the

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*text is  
supplemented  
with over 280  
figures, over  
100 solved  
problems, and  
130 references.  
Continuum  
Mechanics for  
Engineers, Third  
Edition provides  
engineering  
students with a  
complete,*

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*concise, and  
accessible  
introduction to  
advanced  
engineering  
mechanics. The  
impetus for this  
latest edition  
was the need to  
suitably combine  
the introduction  
of continuum  
mechanics,  
linear and*

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nonlinear  
elasticity, and  
viscoelasticity  
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for a graduate-level course sequence. An outgrowth of course notes and problems used to teach these subjects, the third edition of this bestselling text explores

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*the basic concepts behind these topics and demonstrates their application in engineering practice.*

*Presents Material Consistent with Modern Literature A new rearranged and*

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*expanded chapter  
on elasticity  
more completely  
covers Saint-  
Venant's  
solutions.  
Subsections on  
extension,  
torsion, pure  
bending and  
flexure present  
an excellent  
foundation for  
posing and*



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*solving basic  
elasticity  
problems. The  
authors'  
presentation  
enables  
continuum  
mechanics to be  
applied to  
biological  
materials, in  
light of their  
current  
importance. They*

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*have also altered the book's notation—a common struggle for many students—to better align it with modern continuum mechanics literature. This book addresses students' need*

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*to understand  
the  
sophisticated  
simulation  
programs that  
use nonlinear  
kinematics and  
various  
constitutive  
relationships.  
It includes an  
introduction to  
problem solution  
using MATLAB®,*

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*emphasizing this language's value in enabling users to stay focused on fundamentals. This book provides information that is useful in emerging engineering areas, such as micro-mechanics*

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and  
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*With an abundance of worked examples and chapter problems, it carefully explains necessary mathematics as required and presents numerous*

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*illustrations,  
giving students  
and practicing  
professionals an  
excellent self-  
study guide to  
enhance their  
skills. Through  
a mastery of  
this volume's  
contents and  
additional  
rigorous finite  
element*

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*training, they  
will develop the  
mechanics*

*foundation  
necessary to  
skillfully use  
modern, advanced  
design tools.*

*Structural  
Mechanics of  
Anti-Sandwiches  
Introduction to  
Continuum  
Mechanics*

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*Elasticity*  
A Continuum  
Approach  
Waves And Rays  
In Elastic  
Continua (Fourth  
Edition)

This book is  
concerned with  
the study of  
continuum  
mechanics  
applied to



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biological  
systems, i.e.,  
continuum  
biomechanics.  
This vast and  
exciting subject  
allows  
description of  
when a bone may  
fracture due to  
excessive  
loading, how

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blood behaves as both a solid and fluid, down to how cells respond to mechanical forces that lead to changes in their behavior, a process known as mechanotransduction. We have

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written for senior  
undergraduate  
students and first  
year graduate  
students in  
mechanical or  
biomedical  
engineering, but  
individuals  
working at  
biotechnology  
companies that

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deal in  
biomaterials or  
biomechanics  
should also find  
the information  
presented  
relevant and  
easily accessible.  
Table of  
Contents: Tensor  
Calculus /  
Kinematics of a

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Continuum /  
Stress / Elasticity  
/ Fluids / Blood  
and Circulation /  
Viscoelasticity /  
Poroelasticity  
and  
Thermoelasticity /  
Biphasic Theory  
Tremendous  
advances in  
computer

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technologies and methods have precipitated a great demand for refinements in the constitutive models of plasticity. Such refinements include the development of a model that would

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account for material anisotropy and produces results that compare well with experimental data. Key to developing such models-and to meeting many other challenges in the field- is a

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firm grasp of the  
principles of  
continuum

mechanics and  
how they apply to  
the formulation of  
plasticity theory.  
Also critical is  
understanding  
the experimental  
aspects of  
plasticity and



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material  
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anisotropy.  
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Integrating the traditionally separate subjects of continuum mechanics and plasticity, this book builds understanding in all of those areas. Part I provides

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systematic,  
comprehensive  
coverage of  
continuum  
mechanics, from  
a review of  
Cartesian  
tensors to the  
relevant  
conservation  
laws and  
constitutive

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equation. Part II offers an exhaustive presentation of the continuum theory of plasticity. This includes a unique treatment of the experimental aspects of plasticity, covers

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anisotropic  
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plasticity, and  
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incorporates

recent research  
results related to  
the endochronic  
theory of  
plasticity  
obtained by the  
author and his  
colleagues. By  
bringing all of

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these together in  
one book,  
Continuum  
Mechanics and  
Plasticity  
facilitates the  
learning of solid  
mechanics. Its  
readers will be  
well prepared for  
pursuing either  
research related

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to the mechanical  
behavior of  
engineering  
materials or  
developmental  
work in  
engineering  
analysis and  
design.

A bestselling  
textbook in its  
first three

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editions,  
Continuum  
Mechanics for  
Engineers,  
Fourth Edition  
provides  
engineering  
students with a  
complete,  
concise, and  
accessible  
introduction to

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advanced  
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engineering  
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mechanics. It

provides  
information that  
is useful in  
emerging  
engineering  
areas, such as  
micro-mechanics  
and  
biomechanics.



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Through a mastery of this volume's contents and additional rigorous finite element training, readers will develop the mechanics foundation necessary to

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skillfully use  
modern,  
advanced design  
tools. Features:  
Provides a basic,  
understandable  
approach to the  
concepts,  
mathematics, and  
engineering  
applications of  
continuum

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mechanics  
Mechanics Fourth  
Updated  
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throughout, and  
adds a new  
chapter on  
plasticity  
Features an  
expanded  
coverage of  
fluids Includes  
numerous all new  
end-of-chapter

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problems With an abundance of worked examples and chapter problems, it carefully explains necessary mathematics and presents numerous illustrations, giving students

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and practicing professionals an excellent self-study guide to enhance their skills.

Many processes in materials science and engineering, such as the load deformation

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behaviour of  
Mechanics Fourth  
certain  
Edition Solutions  
structures,  
exhibit nonlinear  
characteristics.  
The computer  
simulation of  
such processes  
therefore  
requires a deep  
understanding of  
both the

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theoretical aspects of nonlinearity and the associated computational techniques. This book provides a complete set of exercises and solutions in the field of theoretical and

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computational  
nonlinear  
continuum  
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mechanics and is  
the perfect  
companion to  
Nonlinear  
Continuum  
Mechanics for  
Finite Element  
Analysis, where  
the authors set



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out the theoretical foundations of the subject. It employs notation consistent with the theory book and serves as a great resource to students, researchers and those in industry

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interested in  
gaining  
confidence by  
practising  
through  
examples.

Instructors of the  
subject will also  
find the book  
indispensable in  
aiding student  
learning.

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Fox and  
McDonald's  
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Fluid Mechanics  
Introduction to  
Tensor Calculus  
and Continuum  
Mechanics  
Introduction to  
Engineering  
Mechanics  
Fundamentals of

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Worked

Examples in  
Nonlinear  
Continuum  
Mechanics for  
Finite Element  
Analysis

*A unified  
presentation of  
the concepts*

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*and general  
principles  
common to all  
branches of  
solid and fluid  
mechanics.*

*The book  
retains its  
strong  
conceptual  
approach,  
clearly  
examining the*

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*mathematical underpinnings of FEM, and providing a general approach of engineering application areas. Known for its detailed, carefully selected example*

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*problems and  
extensive  
selection of  
homework  
problems, the  
author has  
comprehensively  
covered a wide  
range of  
engineering  
areas making  
the book  
appropriate for*

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*all engineering  
majors, and  
underscores the*

*wide range of  
use FEM has in  
the*

*professional  
world*

*Multiscale  
Modeling*

*Approaches for  
Composites*

*outlines the*



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*fundamentals of  
common  
multiscale  
modeling  
techniques and  
provides  
detailed  
guidance for  
putting them  
into practice.  
Various  
homogenization  
methods are*

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*presented in a  
simple,  
didactic  
manner, with an  
array of  
numerical  
examples. The  
book starts by  
covering the  
theoretical  
underpinnings  
of tensors and  
continuum*

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mechanics  
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concepts, then  
passes to  
actual  
micromechanic  
techniques for  
composite media  
and laminate  
plates. In the  
last chapters  
the book covers  
advanced topics  
in

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Mechanics, Fourth  
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*homogenization,  
including  
Green's tensor,  
Hashin-  
Shtrikman  
bounds, and  
special types  
of problems.*

*All chapters  
feature  
comprehensive  
analytical and  
numerical*

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*examples  
(Python and  
ABAQUS scripts)  
to better  
illustrate the  
theory. Bridges  
theory and  
practice,  
providing step-  
by-step  
instructions  
for  
implementing*

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*multiscale  
modeling  
approaches for  
composites and  
the theoretical  
concepts behind  
them Covers  
boundary  
conditions,  
data-exchange  
between scales,  
the Hill-Mandel  
principle,*

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*average stress  
and strain  
theorems, and  
more Discusses  
how to obtain  
composite  
properties  
using different  
boundary  
conditions  
Includes access  
to a companion  
site, featuring*

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*the numerical  
examples,  
Python and  
ABACUS codes  
discussed in  
the book  
This self-  
contained  
graduate-level  
text introduces  
classical  
continuum  
models within a*



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*modern  
framework. Its  
numerous  
exercises  
illustrate the  
governing  
principles,  
linearizations,  
and other  
approximations  
that constitute  
classical  
continuum*

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*models.*

*Starting with  
an overview of  
one-dimensional  
continuum  
mechanics, the  
text advances  
to examinations  
of the  
kinematics of  
motion, the  
governing  
equations of*

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*balance, and  
the entropy  
inequality for  
a continuum.*

*The main  
portion of the  
book involves  
models of  
material  
behavior and  
presents  
complete  
formulations of*

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*various general  
continuum  
models. The  
final chapter  
contains an  
introductory  
discussion of  
materials with  
internal state  
variables. Two  
substantial  
appendixes  
cover all of*

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*the mathematical background necessary to understand the text as well as results of representation theorems.*

*Suitable for independent study, this volume features*

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280 exercises  
and 170  
references.

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Mechanics for  
Engineers,  
Third Edition  
Continuum  
Mechanics and  
Plasticity  
Hamilton's  
Principle in  
Continuum*

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*Mechanics*  
*Introduction to*  
*Continuum*

*Biomechanics*  
*Continuum*  
*Mechanics in*  
*the Earth*  
*Sciences*

The essence of  
continuum  
mechanics — the  
internal response

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of materials to  
external loading  
— is often

obscured by the  
complex  
mathematics of  
its formulation.  
By building  
gradually from  
one-dimensional  
to two- and three-  
dimensional



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formulations, this book provides an accessible introduction to the fundamentals of solid and fluid mechanics, covering stress and strain among other key topics. This undergraduate

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text presents  
several real-  
world case

studies, such as  
the St. Francis  
Dam, to illustrate  
the mathematical  
connections  
between solid  
and fluid  
mechanics, with  
an emphasis on

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practical applications of these concepts to mechanical, civil, and electrical engineering structures and design.

This best-selling textbook presents the

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concepts of  
continuum  
mechanics in a  
simple yet  
rigorous manner.  
It introduces the  
invariant form as  
well as the  
component form  
of the basic  
equations and  
their applications

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to problems in  
elasticity, fluid  
mechanics and  
heat transfer,  
and offers a brief  
introduction to  
linear  
viscoelasticity.  
The book is ideal  
for advanced  
undergraduates  
and graduate

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students looking  
to gain a strong  
background in  
the basic  
principles  
common to all  
major  
engineering  
fields, and for  
those who will  
pursue further  
work in fluid

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dynamics,  
Mechanics Fourth  
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elasticity, plates  
and shells,  
viscoelasticity,  
plasticity, and  
interdisciplinary  
areas such as  
geomechanics,  
biomechanics,  
mechanobiology  
and nanoscience.  
The book

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features  
Mechanics Fourth  
derivations of  
Edition Solutions  
the basic

equations of  
mechanics in  
invariant (vector  
and tensor) form  
and specification  
of the governing  
equations to  
various co-  
ordinate



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systems, and  
numerous  
illustrative  
examples,  
chapter  
summaries and  
exercise  
problems. This  
second edition  
includes  
additional  
explanations,

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examples and  
problems.  
"Presents

several advanced  
topics including  
fourth-order  
tensors,  
differentiation of  
tensors,  
exponential and  
logarithmic  
tensors, and

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their application  
to nonlinear  
elasticity" --

This is an  
intermediate  
book for  
beginning  
postgraduate  
students and  
junior  
researchers, and  
offers up-to-date

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content on both  
continuum  
mechanics and  
elasticity. The  
material is self-  
contained and  
should provide  
readers  
sufficient  
working  
knowledge in  
both areas.

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Though the focus is primarily on vector and tensor calculus (the so-called coordinate-free approach), the more traditional index notation is used whenever it is deemed more

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sensible. With the increasing demand for continuum modeling in such diverse areas as mathematical biology and geology, it is imperative to have various approaches to

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continuum  
mechanics and  
elasticity. This  
book presents  
these subjects  
from an applied  
mathematics  
perspective. In  
particular, it  
extensively uses  
linear algebra  
and vector

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calculus to  
develop the  
fundamentals of  
both subjects in  
a way that  
requires minimal  
use of  
coordinates (so  
that beginning  
graduate  
students and  
junior



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researchers  
come to  
appreciate the  
power of the  
tensor notation).  
Solids and  
Fluids, Analysis  
and Design  
Continuum  
Mechanics and  
Thermodynamics  
An Introduction

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and Noll  
An Applied  
Mathematics  
Introduction  
With  
Applications to  
Continuum  
Mechanics  
*Through ten*

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*editions, Fox and McDonald's Introduction to Fluid Mechanics has helped students understand the physical concepts, basic principles, and analysis methods of fluid mechanics. This market-leading textbook provides a*

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*balanced,  
systematic  
approach to  
mastering critical  
concepts with the  
proven Fox-  
McDonald solution  
methodology. In-  
depth yet  
accessible chapters  
present governing  
equations, clearly  
state assumptions,*

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*and relate mathematical results to corresponding physical behavior. Emphasis is placed on the use of control volumes to support a practical, theoretically-inclusive problem-solving approach to the subject. Each*

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*comprehensive  
chapter includes  
numerous, easy-to-  
follow examples  
that illustrate good  
solution technique  
and explain  
challenging points.  
A broad range of  
carefully selected  
topics describe how  
to apply the  
governing*

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*equations to various problems, and explain physical concepts to enable students to model real-world fluid flow situations. Topics include flow measurement, dimensional analysis and similitude, flow in pipes, ducts, and*

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*open channels, fluid  
machinery, and  
more. To enhance  
student learning,  
the book  
incorporates  
numerous  
pedagogical  
features including  
chapter summaries  
and learning  
objectives, end-of-  
chapter problems,*



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*useful equations,  
and design and  
open-ended  
problems that  
encourage students  
to apply fluid  
mechanics  
principles to the  
design of devices  
and systems.*

*This book provides  
an extensive  
introduction to the*

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mechanics of anti-  
sandwiches: non-  
classical Solutions

*composites with  
multiple  
homogeneous  
layers but widely  
differing  
parameters  
concerning their  
geometry and  
materials.*

*Therefore, they*  
Page 98/207

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*require special attention in the context of structural mechanics. The theoretical framework presented here is based on a five parametric, planar continuum, which is a pragmatic version of the COSSERAT*

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*shell. The direct approach used here is enlarged where constraints are introduced to couple layers and furnish a layer-wise theory. Restrictions are made in terms of linearity - geometrical and physical. After having defined*

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*appropriate variables for the kinematics and kinetics, linear elastic material behaviour is considered, where the constitutive tensors are introduced in the context of isotropy. The basics are presented in a clear*

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*and distinct manner  
using index-free  
tensor notation.*

*This format is  
simple, concise,  
and practical.*

*Closed-form  
solutions of such  
boundary value  
problems are  
usually associated  
with serious  
limitations on the*

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*boundary conditions, which constitutes a serious disadvantage. To construct approximate solutions, a variational method is employed as the basis for computational procedures where*

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*the Finite Element Method is applied. Therefore, the introduction of the vector-matrix notation is convenient. Based on the plane considerations, a finite eight-node SERENDIPITY element with enlarged degrees of*



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*freedom is realised. To avoid artificial stiffening effects, various integration types are applied, and the solutions generated are subsequently verified with closed-form solutions for monolithic limiting cases. Within this setting, it is*

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*possible to efficiently calculate the global structural behaviour of Anti-Sandwiches, at least up to a certain degree. The power of the proposed method in combination with the numerical solution approach is demonstrated for*

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*several case and parameter studies. In this regard, the optimal geometrical and material parameters to increase stiffness are analysed and the results for the kinematic and kinetic quantities are discussed.*

*Through several*

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*centuries there has been a lively interaction between mathematics and mechanics. On the one side, mechanics has used mathematics to formulate the basic laws and to apply them to a host of problems that call for the quantitative*

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*prediction of the consequences of some action. On the other side, the needs of mechanics have stimulated the development of mathematical concepts.*

*Differential calculus grew out of the needs of Newtonian dynamics; vector*

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*algebra was developed as a means . to describe force systems; vector analysis, to study velocity fields and force fields; and the calculus of variations has evolved from the energy principles of mechanics. In recent times the*

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*theory of tensors has attracted the attention of the mechanics people. Its very name indicates its origin in the theory of elasticity. For a long time little use has been made of it in this area, but in the last decade its usefulness in the*

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mechanics of  
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continuous media  
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*has been widely  
recognized. While  
the undergraduate  
textbook literature  
in this country was  
becoming  
"vectorized"  
(lagging almost half  
a century behind  
the development in  
Europe), books*



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dealing with various  
aspects of  
continuum

mechanics took to  
tensors like fish to  
water. Since many  
authors were not  
sure whether their  
readers were  
sufficiently familiar  
with tensors~ they  
either added' a  
chapter on tensors

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*or wrote a separate  
book on the  
subject.*

*Continuum  
mechanics studies  
the response of  
materials to  
different loading  
conditions. The  
concept of tensors  
is introduced  
through the idea of  
linear*

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*transformation in a self-contained chapter, and the interrelation of direct notation, indicial notation and matrix operations is clearly presented. A wide range of idealized materials are considered through simple static and*

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*dynamic problems,  
and the book  
contains an  
abundance of  
illustrative  
examples and  
problems, many  
with solutions.  
Through the  
addition of more  
advanced material  
(solution of classical  
elasticity problems,*

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*constitutive  
equations for  
viscoelastic fluids,  
and finite  
deformation  
theory), this  
popular  
introduction to  
modern continuum  
mechanics has  
been fully revised  
to serve a dual  
purpose: for*

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From Fundamental  
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e treatment offers  
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exercises to  
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equations, jump  
conditions, and  
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underlies many geological and geophysical phenomena, from earthquakes and faults to the fluid dynamics of the Earth. This interdisciplinary book provides geoscientists, physicists and applied

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mathematicians  
with a class-  
tested, accessible  
overview of  
continuum  
mechanics.

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thermodynamic  
principles and  
geometrical  
insights, the book  
surveys solid, fluid  
and gas dynamics.

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In later review chapters, it explores new aspects of the field emerging from nonlinearity and dynamical complexity and provides a brief introduction to computational modeling. Simple, yet rigorous,

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derivations are used to review the essential

mathematics. The author emphasizes the full three-dimensional geometries of real-world examples, enabling students to apply this in deconstructing solid earth and

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planet-related  
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sets and worked

examples are  
provided, making  
this a practical  
resource for  
graduate students  
in geophysics,  
planetary physics  
and geology and a  
beneficial tool for  
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scientists seeking a better understanding of the mathematics and physics within Earth sciences.

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Modeling of  
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offers a uniquely  
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introduction to

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topics like RVE  
theory, fabric  
tensor models,  
micropolar  
elasticity, elasticity  
with voids,  
nonlocal higher  
gradient elasticity  
and damage  
mechanics.  
Contemporary  
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research has been moving into areas of complex material microstructural behavior. Graduate students who are expected to do this type of research need a fundamental background beyond classical



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continuum theories. The book begins with several chapters that carefully and rigorously present mathematical preliminaries; kinematics of motion and deformation; force and stress measures; and

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mass, momentum  
and energy  
balance principles.  
The book then  
moves beyond  
other books by  
dedicating the last  
chapter to  
constitutive  
equation  
development,  
exploring a wide  
collection of

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constitutive relations and developing the corresponding material model formulations. Such material behavior models include classical linear theories of elasticity, fluid mechanics, viscoelasticity and

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plasticity, as well as linear and nonlinear theories of solids and fluids, including finite elasticity, nonlinear/non-Newtonian viscous fluids, and nonlinear viscoelastic materials. Finally, several relatively

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new continuum theories based on incorporation of material microstructure are presented including: fabric tensor theories, micropolar elasticity, elasticity with voids, nonlocal higher gradient elasticity

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and damage  
mechanics. Offers  
a thorough,  
concise and  
organized  
presentation of  
continuum  
mechanics  
formulation  
Covers numerous  
applications in  
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including  
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problems  
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students more  
tools to solve,  
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comprehensive and rigorous description of the application of Hamilton's principle to continuous media. To introduce terminology and initial concepts, it begins with what is called the first problem of the

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calculus of variations. For both historical and pedagogical reasons, it first discusses the application of the principle to systems of particles, including conservative and non-conservative systems and

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systems with constraints. The foundations of mechanics of continua are introduced in the context of inner product spaces. With this basis, the application of Hamilton's principle to the classical theories

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of fluid and solid mechanics are covered. Then recent developments are described, including materials with microstructure, mixtures, and continua with singular surfaces.

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are several books  
in print dealing**

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**with elasticity,  
many focus on  
specialized  
topics such as  
mathematical  
foundations,  
anisotropic  
materials, two-  
dimensional  
problems,  
thermoelasticity,  
non-linear  
theory, etc. As  
such they are not**

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Provides  
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solutions useful  
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Fundamentals of  
Continuum  
Mechanics  
focuses on the  
fundamentals of  
the subject and**

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**provides the  
background for  
formulation of  
numerical  
methods for  
large  
deformations and  
a wide range of  
material  
behaviours. It  
aims to provide  
the foundations  
for further study,  
not just of these**

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**subjects, but also  
the formulations  
for much more  
complex material  
behaviour and  
their  
implementation  
computationally.  
This book is  
divided into 5  
parts, covering  
mathematical  
preliminaries,  
stress, motion**

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energy, and ideal  
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characterize the  
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dynamics; and  
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**branch of**  
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motivates the  
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Material  
Behavior  
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and Continuum  
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*This textbook offers  
an introduction to*

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mechanical behavior  
of solids within  
continuum  
mechanics and  
thermodynamics. To  
illustrate the  
fundamental  
principles, the book  
starts with an  
overview of the  
most important  
models in one  
dimension. Tensor*

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***calculus, which is called for in three-dimensional modeling, is concisely presented in the second part of the book. Once the reader is equipped with these essential mathematical tools, the third part of the book develops the foundations of continuum***

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*mechanics right  
from the beginning.  
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fourth part focuses  
on modeling the  
mechanics of  
materials and in  
particular elasticity,  
viscoelasticity and  
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to reflect students'  
ready access to  
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*with new examples,*  
*including the ring*  
*line vortex and the*  
*Fraenkel-Norbury*  
*vortex solutions A*  
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***different behaviors  
that occur in  
subsonic and  
supersonic steady  
flows Additional  
emphasis on  
composite  
asymptotic  
expansions  
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is the ideal  
coursebook for  
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engineering  
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between  
engineering courses  
in tensor algebra on  
one hand, and the  
treatment of linear  
transformations  
within classical***

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are accompanied by  
solutions enabling  
autonomous study.***

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deal with modern  
developments in the  
theory of isotropic  
and anisotropic  
tensor functions and  
their applications to  
continuum  
mechanics and  
might therefore be***

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this area.**

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directly related to  
nonlinear materials  
modeling for  
graduate students  
and researchers in  
physics, materials  
science, chemistry  
and engineering.  
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presentation is  
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case of the  
classical

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mechanics of  
nonpolar  
materials,  
leaving aside  
the effects of  
internal  
structure,  
temperature  
and electromag  
netism, and  
excluding other  
mathematical

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models, such as statistical mechanics, relativistic mechanics and quantum mechanics. Within the limitations of the simplest mechanical theory, the

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author had provided a text that is largely self-contained. Though the book is primarily an introduction to continuum mechanics, the lure and attraction

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inherent in the  
subject may also  
recommend the

book as a  
vehicle by which  
the student can  
obtain a broader  
appreciation of  
certain  
important  
methods and  
results from

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classical and  
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modern  
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introduction to  
tensor calculus  
and continuum  
mechanics. i.e.  
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mathematics  
developing basic  
equations in

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Linear Elasticity

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text offers an  
analysis of  
deformation and  
stress, covers laws  
of conservation of  
mass, momentum,  
and energy, and*



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*surveys the  
formulation of  
mechanical  
constitutive  
equations. 1992  
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Mechanics is a  
branch of physical  
mechanics that  
describes the  
macroscopic  
mechanical  
behavior of solid or*

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*fluid materials considered to be continuously distributed. It is fundamental to the fields of civil, mechanical, chemical and bioengineering. This time-tested text has been used for over 35 years to introduce junior and senior-level*

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undergraduate  
engineering  
students, as well  
as graduate  
students, to the  
basic principles of  
continuum  
mechanics and  
their applications  
to real engineering  
problems. The text  
begins with a  
detailed  
presentation of the

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*coordinate  
invariant quantity,  
the tensor,  
introduced as a  
linear  
transformation.  
This is then  
followed by the  
formulation of the  
kinematics of  
deformation, large  
as well as very  
small, the  
description of*

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*stresses and the basic laws of continuum mechanics. As applications of these laws, the behaviors of certain material idealizations (models) including the elastic, viscous and viscoelastic materials, are presented. This*

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*new edition offers expanded coverage of the subject matter both in terms of details and contents, providing greater flexibility for either a one or two-semester course in either continuum mechanics or elasticity. Although this current edition*

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*has expanded the coverage of the subject matter, it nevertheless uses the same approach as that in the earlier editions - that one can cover advanced topics in an elementary way that go from simple to complex, using a wealth of illustrative*

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*examples and problems. It is, and will remain, one of the most accessible textbooks on this challenging engineering subject.*

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*of some 3-D  
problems based on  
the fundamental  
potential functions  
approach. New  
section at the end  
of Chapter 4  
devoted to the  
integral  
formulation of the  
field equations  
Seven new  
appendices appear  
at the end of the*

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*relevant chapters  
to help make each  
chapter more self-  
contained*

*Expanded and  
improved problem  
sets providing both  
intellectual  
challenges and  
engineering  
applications  
Designing  
engineering  
components that*

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*make optimal use  
of materials  
requires  
consideration of  
the nonlinear  
characteristics  
associated with  
both  
manufacturing and  
working  
environments. The  
modeling of these  
characteristics can  
only be done*

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*through numerical  
formulation and  
simulation, and  
this requires an  
understanding of  
both the  
theoretical  
background and  
associated  
computer solution  
techniques. By  
presenting both  
nonlinear  
continuum analysis*

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*and associated  
finite element  
techniques under  
one roof, Bonet  
and Wood provide,  
in this edition of  
this successful  
text, a complete,  
clear, and unified  
treatment of these  
important subjects.  
New chapters  
dealing with  
hyperelastic plastic*

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*behavior are included, and the authors have thoroughly updated the FLagSHyP program, freely accessible at [www.flagshyp.com](http://www.flagshyp.com). Worked examples and exercises complete each chapter, making the text an*

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studying nonlinear  
continuum  
mechanics. It is  
also ideal for those  
in industry  
requiring an  
appreciation of the  
way in which their  
computer  
simulation  
programs work.