Download free Matematica numerica unitext (2023)

Structural optimization through neural networks for the anti-seismic design Analytic functions Integral transforms Differential Equations Numerical Approximation of Ordinary Differential Problems Matematica Numerica Numerical Analysis of Ordinary and Delay Differential Equations Solving Numerical PDEs: Problems, Applications, Exercises Modellistica Numerica per Problemi Differenziali Mathematical Models and Numerical Simulation in Electromagnetism Analisi Complessa Trasformate Equazioni Differenziali Analisi Complessa Trasformate Equazioni Differenziali Numerical Models for Differential Problems Numerical Approximation of Partial Differential Equations Numerical Control: Part A Numerical Methods and Applications Mathematical Analysis Tools for Engineering Numerical Methods for Nonlinear Partial Differential Equations Numerical Infinities and Infinitesimals in Optimization Numerical Mathematics and Advanced Applications ENUMATH 2015 Analytic Functions Integral Transforms Differential Equations Equazioni a derivate parziali Mathematical Analysis II Computational Techniques and Applications: CTAC 95 Calcolo Scientifico Algebra lineare ed equazioni differenziali ordinarie Geometria Differenziale Logica: Metodo Breve

Equazioni a derivate parziali Nonlinear Dynamics and Stochastic Mechanics Optimization and Approximation Mathematical Modelling of the Human Cardiovascular System Reduced Basis Methods for Partial Differential Equations Partial Differential Equations in Action Solving Hyperbolic Equations with Finite Volume Methods Feynman Integrals A Primer on Mathematical Modelling Deutsche Nationalbibliographie und Bibliographie der im Ausland erschienenen deutschsprachigen Veröffentlichungen Meccanica Razionale Geometria proiettiva Topologia A Textbook of Algebraic Number Theory

Structural optimization through neural networks for the anti-seismic design 2021-03-17

neural network based algorithms find numerous applications in different scientific fields and in particular in the various areas of engineering in civil engineering however there are still few applications of such methods the purpose of this thesis is to apply the resolution capabilities of artificial neural networks to structural design

Analytic functions Integral transforms Differential Equations *2020-07-01*

differential equations play a relevant role in many disciplines and provide powerful tools for analysis and modeling in applied sciences the book contains several classical and modern methods for the study of ordinary and partial differential equations a broad space is reserved to fourier and laplace transforms together with their applications to the solution of boundary value and or initial value problems for differential equations basic prerequisites concerning analytic functions of complex variable and lp spaces are synthetically presented in the first two chapters techniques based on

integral transforms and fourier series are presented in specific chapters first in the easier framework of integrable functions and later in the general framework of distributions the less elementary distributional context allows to deal also with differential equations with highly irregular data and pulse signals the theory is introduced concisely while learning of miscellaneous methods is achieved step by step through the proposal of many exercises of increasing difficulty additional recap exercises are collected in dedicated sections several tables for easy reference of main formulas are available at the end of the book the presentation is oriented mainly to students of schools in engineering sciences and economy the partition of various topics in several self contained and independent sections allows an easy splitting in at least two didactic modules one at undergraduate level the other at graduate level

Numerical Approximation of Ordinary Differential Problems *2023-09-26*

this book is focused on the numerical discretization of ordinary differential equations odes under several perspectives the attention is first conveyed to providing accurate numerical solutions of deterministic problems then the presentation moves to a more modern vision of numerical approximation

oriented to reproducing qualitative properties of the continuous problem along the discretized dynamics over long times the book finally performs some steps in the direction of stochastic differential equations sdes with the intention of offering useful tools to generalize the techniques introduced for the numerical approximation of odes to the stochastic case as well as of presenting numerical issues natively introduced for sdes the book is the result of an intense teaching experience as well as of the research carried out in the last decade by the author it is both intended for students and instructors for the students this book is comprehensive and rather self contained for the instructors there is material for one or more monographic courses on odes and related topics in this respect the book can be followed in its designed path and includes motivational aspects historical background examples and a software programs implemented in matlab that can be useful for the laboratory part of a course on numerical odes sdes the book also contains the portraits of several pioneers in the numerical discretization of differential problems useful to provide a framework to understand their contributes in the presented fields last but not least rigor joins readability in the book

Matematica Numerica *2014-04-12*

la matematica numerica è elemento fondante del calcolo scientifico punto di contatto di diverse discipline nella matematica e nelle moderne scienze applicate ne diventa strumento di indagine qualitativa e quantitativa scopo di questo testo è fornire i fondamenti metodologici della matematica numerica richiamandone le principali proprietà quali la stabilità l accuratezza e la complessità algoritmica nel contesto di ogni specifica classe di problemi vengono illustrati gli algoritmi più idonei ne viene fatta l analisi teorica e se ne verificano i risultati previsti implementandoli con l ausilio di programmi in linguaggio matlab ogni capitolo è integrato da esercizi e temi svolti questi ultimi corredati da programmi matlab il volume è indirizzato principalmente agli studenti delle facoltà scientifiche con particolare attenzione ai corsi di laurea in ingegneria matematica e scienze dell informazione l enfasi posta sullo sviluppo di software lo rende interessante anche per ricercatori e utilizzatori delle tecniche del calcolo scientifico nei campi professionali più disparati la quarta edizione contiene numerose integrazioni in quasi tutti i capitoli diverse sezioni sono inoltre state rivisitate con lo scopo di rendere più chiari concetti ed argomenti di considerevole complessità

Numerical Analysis of Ordinary and Delay Differential Equations *2023-05-23*

this book serves as a concise textbook for students in an advanced undergraduate or first year graduate course in various disciplines such as applied mathematics control and engineering who want to understand the modern standard of numerical methods of ordinary and delay differential equations experts in the same fields can also learn about the recent developments in numerical analysis of such differential systems ordinary differential equations odes provide a strong mathematical tool to express a wide variety of phenomena in science and engineering along with its own significance one of the powerful directions toward which odes extend is to incorporate an unknown function with delayed argument this is called delay differential equations ddes which often appear in mathematical modelling of biology demography epidemiology and control theory in some cases the solution of a differential equation can be obtained by algebraic combinations of known mathematical functions in many practical cases however such a solution is quite difficult or unavailable and numerical approximations are called for modern development of computers accelerates the situation and moreover launches more possibilities of numerical means henceforth the knowledge and expertise of the numerical solution of differential equations becomes a

requirement in broad areas of science and engineering one might think that a well organized software package such as matlab serves much the same solution in a sense this is true but it must be kept in mind that blind employment of software packages misleads the user the gist of numerical solution of differential equations still must be learned the present book is intended to provide the essence of numerical solutions of ordinary differential equations as well as of delay differential equations particularly the authors noted that there are still few concise textbooks of delay differential equations and then they set about filling the gap through descriptions as transparent as possible major algorithms of numerical solution are clearly described in this book the stability of solutions of odes and ddes is crucial as well the book introduces the asymptotic stability of analytical and numerical solutions and provides a practical way to analyze their stability by employing a theory of complex functions

Solving Numerical PDEs: Problems, Applications, Exercises *2012-04-05*

this book stems from the long standing teaching experience of the authors in the courses on numerical methods in engineering and numerical methods for partial differential equations given to undergraduate and graduate students

of politecnico di milano italy epfl lausanne switzerland university of bergamo italy and emory university atlanta usa it aims at introducing students to the numerical approximation of partial differential equations pdes one of the difficulties of this subject is to identify the right trade off between theoretical concepts and their actual use in practice with this collection of examples and exercises we try to address this issue by illustrating academic examples which focus on basic concepts of numerical analysis as well as problems derived from practical application which the student is encouraged to formalize in terms of pdes analyze and solve the latter examples are derived from the experience of the authors in research project developed in collaboration with scientists of different fields biology medicine etc and industry we wanted this book to be useful both to readers more interested in the theoretical aspects and those more concerned with the numerical implementation

Modellistica Numerica per Problemi Differenziali 2016-05-24

in questo testo si introducono i concetti di base per la modellistica numerica di problemi differenziali alle derivate parziali si considerano le classiche equazioni lineari ellittiche paraboliche ed iperboliche ma anche

altre equazioni quali quelle di diffusione e trasporto di navier stokes e le leggi di conservazione si forniscono inoltre numerosi esempi fisici che stanno alla base di tali equazioni quindi si analizzano metodi di risoluzione numerica basati su elementi finiti continui e discontinui differenze finite volumi finiti metodi spettrali continui e discontinui nonché strategie di approssimazione più avanzate basate sui metodi di decomposizione di domini o quelli di risoluzione di problemi di controllo ottimale in particolare vengono discussi gli aspetti algoritmici e di implementazione al calcolatore e si forniscono diversi programmi di semplice utilizzo il testo non presuppone una approfondita conoscenza matematica delle equazioni alle derivate parziali i concetti rigorosamente indispensabili al riguardo sono riportati nell appendice esso è pertanto adatto agli studenti dei corsi di laurea di indirizzo scientifico ingegneria matematica fisica scienze dell informazione e consigliabile a ricercatori del mondo accademico ed extra accademico che vogliano avvicinarsi a questo interessante ramo della matematica applicata e delle scienze computazionali

<u>Mathematical Models and Numerical Simulation in Electromagnetism</u> *2014-07-22*

the book represents a basic support for a master course in electromagnetism

oriented to numerical simulation the main goal of the book is that the reader knows the boundary value problems of partial differential equations that should be solved in order to perform computer simulation of electromagnetic processes moreover it includes a part devoted to electric circuit theory based on ordinary differential equations the book is mainly oriented to electric engineering applications going from the general to the specific namely from the full maxwell s equations to the particular cases of electrostatics direct current magnetostatics and eddy currents models apart from standard exercises related to analytical calculus the book includes some others oriented to real life applications solved with maxfem free simulation software

Analisi Complessa Trasformate Equazioni Differenziali *2023-02-08*

le equazioni differenziali svolgono un ruolo di primaria importanza in moltissimi campi e sono validi strumenti di modellazione e analisi nelle scienze applicate questo volume fornisce una introduzione di taglio moderno ad alcuni metodi classici per l analisi di equazioni differenziali ordinarie e a derivate parziali la trasformata di fourier la trasformata di laplace le serie di fourier le funzioni analitiche di variabile complessa e le

distribuzioni sono trattati problemi per equazioni differenziali con condizioni iniziali o al contorno o sull energia delle soluzioni sia in ambito classico che distribuzionale l aspetto innovativo della presentazione consiste nell articolazione della materia ogni argomento è prima introdotto da una presentazione sintetica della teoria e degli strumenti di analisi che omette le dimostrazioni ma include proprietà definizioni di base e risultati avanzati ed è poi sviluppato con una ampia rassegna di esempi ed esercizi contenenti anche le dimostrazioni più significative la maggior parte degli esercizi è supportata dallo svolgimento completo della soluzione sono proposti anche alcuni test di autovalutazione basati su gruppi di quesiti a risposta multipla il testo è corre dato da numerose tabelle riassuntive e di rapida consultazione il volume è indirizzato principalmente agli studenti delle scuole di ingegneria scienze ed economia la suddivisione della materia in sezioni indipendenti si presta ad essere utilizzata in più moduli didattici uno inserito nella laurea triennale l altro nella laurea magistrale la presente quinta edizione riveduta ed ampliata è disponibile anche in lingua inglese ed in formato e book gli autori afferiscono al dipartimento di matematica del politecnico di milano

Analisi Complessa Trasformate Equazioni Differenziali *2015-09-09*

le equazioni differenziali svolgono un ruolo di primaria importanza in moltissimi campi e sono validi strumenti di modellazione e analisi nelle scienze applicate questo volume fornisce una introduzione di taglio moderno ad alcuni metodi classici per l analisi di equazioni differenziali ordinarie e a derivate parziali la trasformata di fourier la trasformata di laplace le serie di fourier le funzioni analitiche di variabile complessa e le distribuzioni sono trattati problemi per equazioni differenziali con condizioni iniziali o al contorno o sull energia delle soluzioni sia in ambito classico che distribuzionale l aspetto innovativo della presentazione consiste nell articolazione della materia ogni argomento e prima introdotto da una presentazione sintetica della teoria e degli strumenti di analisi che omette le dimostrazioni ma include proprieta definizioni di base e risultati avanzati ed e poi sviluppato con una ampia rasse gna di esempi ed esercizi contenenti anche le dimostrazioni piu significative la maggior parte degli esercizi e supportata dallo svolgimento completo della soluzione sono proposti anche alcuni test di autovalutazione basati su gruppi di quesiti a risposta multipla il testo e corredato da numerose tabelle riassuntive e di rapida consultazione il volume e indirizzato principalmente agli studenti

delle scuole di ingegneria scienze ed economia la suddivisione della materia in sezioni indipendenti si presta ad essere utilizzata in piu moduli didattici uno inserito nella laurea triennale l altro nella laurea magistrale la terza edizione disponibile anche in lingua inglese e stata riveduta ed ampliata con approfondimenti degli elementi di teoria ed ulteriori nuovi esercizi

Numerical Models for Differential Problems 2017-10-10

in this text we introduce the basic concepts for the numerical modeling of partial differential equations we consider the classical elliptic parabolic and hyperbolic linear equations but also the diffusion transport and navier stokes equations as well as equations representing conservation laws saddle point problems and optimal control problems furthermore we provide numerous physical examples which underline such equations we then analyze numerical solution methods based on finite elements finite differences finite volumes spectral methods and domain decomposition methods and reduced basis methods in particular we discuss the algorithmic and computer implementation aspects and provide a number of easy to use programs the text does not require any previous advanced mathematical knowledge of partial differential equations

the absolutely essential concepts are reported in a preliminary chapter it is therefore suitable for students of bachelor and master courses in scientific disciplines and recommendable to those researchers in the academic and extra academic domain who want to approach this interesting branch of applied mathematics

<u>Numerical Approximation of Partial Differential Equations</u> *2016-06-02*

finite element methods for approximating partial differential equations have reached a high degree of maturity and are an indispensible tool in science and technology this textbook aims at providing a thorough introduction to the construction analysis and implementation of finite element methods for model problems arising in continuum mechanics the first part of the book discusses elementary properties of linear partial differential equations along with their basic numerical approximation the functional analytical framework for rigorously establishing existence of solutions and the construction and analysis of basic finite element methods the second part is devoted to the optimal adaptive approximation of singularities and the fast iterative solution of linear systems of equations arising from finite element discretizations in the third part the mathematical framework for analyzing

and discretizing saddle point problems is formulated corresponding finte element methods are analyzed and particular applications including incompressible elasticity thin elastic objects electromagnetism and fluid mechanics are addressed the book includes theoretical problems and practical projects for all chapters and an introduction to the implementation of finite element methods

Numerical Control: Part A *2022-02-15*

numerical control part a volume 23 in the handbook of numerical analysis series highlights new advances in the field with this new volume presenting interesting chapters written by an international board of authors chapters in this volume include numerics for finite dimensional control systems moments and convex optimization for analysis and control of nonlinear pdes the turnpike property in optimal control structure preserving numerical schemes for hamiltonian dynamics optimal control of pdes and fe approximation filtration techniques for the uniform controllability of semi discrete hyperbolic equations numerical controllability properties of fractional partial differential equations optimal control numerics and applications of fractional pdes and much more provides the authority and expertise of leading contributors from an international board of authors presents the latest release in the handbook of numerical analysis series updated release includes

the latest information on numerical control

Numerical Methods and Applications *2019-01-21*

this book constitutes the thoroughly refereed post conference proceedings of the 9th international conference on numerical methods and applications nma 2018 held in borovets bulgaria in august 2018 the 56 revised regular papers presented were carefully reviewed and selected from 61 submissions for inclusion in this book the papers are organized in the following topical sections numerical search and optimization problem driven numerical method motivation and application numerical methods for fractional diffusion problems orthogonal polynomials and numerical quadratures and monte carlo and quasi monte carlo methods

Mathematical Analysis Tools for Engineering *2021-09-01*

this book is an introduction to the study of ordinary differential equations and partial differential equations ranging from elementary techniques to advanced tools the presentation focusses on initial value problems boundary value problems equations with delayed argument and analysis of periodic

solutions main goals are the analysis of diffusion equation wave equation laplace equation and signals the study of relevant examples of differential models highlights the notion of well posed problem an expanded tutorial chapter collects the topics from basic undergraduate calculus that are used in subsequent chapters a wide exposition concerning classical methods for solving problems related to differential equations is available mainly separation of variables and fourier series with basic worked exercises a whole chapter deals with the analytic functions of complex variable an introduction to function spaces distributions and basic notions of functional analysis is present several chapters are devoted to fourier and laplace transforms methods to solve boundary value problems and initial value problems for differential equations tools for the analysis appear gradually first in function spaces then in the more general framework of distributions where a powerful arsenal of techniques allows dealing with impulsive signals and singularities in both data and solutions of differential problems this second edition contains additional exercises and a new chapter concerning signals and filters analysis in connection to integral transforms

Numerical Methods for Nonlinear Partial

Differential Equations *2015-01-19*

the description of many interesting phenomena in science and engineering leads to infinite dimensional minimization or evolution problems that define nonlinear partial differential equations while the development and analysis of numerical methods for linear partial differential equations is nearly complete only few results are available in the case of nonlinear equations this monograph devises numerical methods for nonlinear model problems arising in the mathematical description of phase transitions large bending problems image processing and inelastic material behavior for each of these problems the underlying mathematical model is discussed the essential analytical properties are explained and the proposed numerical method is rigorously analyzed the practicality of the algorithms is illustrated by means of short implementations

Numerical Infinities and Infinitesimals in Optimization *2022-07-05*

this book provides a friendly introduction to the paradigm and proposes a broad panorama of killing applications of the infinity computer in optimization radically new numerical algorithms great theoretical insights

efficient software implementations and interesting practical case studies this is the first book presenting to the readers interested in optimization the advantages of a recently introduced supercomputing paradigm that allows to numerically work with different infinities and infinitesimals on the infinity computer patented in several countries one of the editors of the book is the creator of the infinity computer and another editor was the first who has started to use it in optimization their results were awarded by numerous scientific prizes this engaging book opens new horizons for researchers engineers professors and students with interests in supercomputing paradigms optimization decision making game theory and foundations of mathematics and computer science mathematicians have never been comfortable handling infinities but an entirely new type of mathematics looks set to by pass the problem today yaroslav sergeyev a mathematician at the university of calabria in italy solves this problem mit technology review these ideas and future hardware prototypes may be productive in all fields of science where infinite and infinitesimal numbers derivatives integrals series fractals are used a adamatzky editor in chief of the international journal of unconventional computing i am sure that the new approach will have a very deep impact both on mathematics and computer science d trigiante computational management science within the grossone framework it becomes feasible to deal computationally with infinite quantities in a way that is both new in the sense that previously intractable problems become amenable to

computation and natural r gangle g caterina f tohmé soft computing the computational features offered by the infinity computer allow us to dynamically change the accuracy of representation and floating point operations during the flow of a computation when suitably implemented this possibility turns out to be particularly advantageous when solving ill conditioned problems in fact compared with a standard multi precision arithmetic here the accuracy is improved only when needed thus not affecting that much the overall computational effort p amodio l brugnano f iavernaro f mazzia soft computing

Numerical Mathematics and Advanced Applications ENUMATH 2015 2016-11-09

the european conference on numerical mathematics and advanced applications enumath held every 2 years provides a forum for discussing recent advances in and aspects of numerical mathematics and scientific and industrial applications the previous enumath meetings took place in paris 1995 heidelberg 1997 jyvaskyla 1999 ischia 2001 prague 2003 santiago de compostela 2005 graz 2007 uppsala 2009 leicester 2011 and lausanne 2013 this book presents a selection of invited and contributed lectures from the enumath 2015 conference which was organised by the institute of applied mathematics

iam middle east technical university ankara turkey from september 14 to 18 2015 it offers an overview of central recent developments in numerical analysis computational mathematics and applications in the form of contributions by leading experts in the field

Analytic Functions Integral Transforms Differential Equations *2023-02-09*

differential equations play a relevant role in many disciplines and provide powerful tools for analysis and modeling in applied sciences the book contains several classical and modern methods for the study of ordinary and partial differential equations a broad space is reserved to fourier and laplace transforms together with their applications to the solution of boundary value and or initial value problems for differential equations basic prerequisites concerning analytic functions of complex variable and lp spaces are synthetically presented in the first two chapters techniques based on integral transforms and fourier series are presented in specific chapters first in the easier framework of integrable functions and later in the general framework of distributions the less elementary distributional context allows to deal also with differential equations with highly irregular data and pulse signals the theory is introduced concisely while learning of

miscellaneous methods is achieved step by step through the proposal of many exercises of increasing difficulty additional recap exercises are collected in dedicated sections several tables for easy reference of main formulas are available at the end of the book the presentation is oriented mainly to students of schools in engineering sciences and economy the partition of various topics in several self contained and independent sections allows an easy splitting in at least two didactic modules one at undergraduate level the other at graduate level this text is the english translation of last edition of the italian book analisi complessa trasformate equazioni differenziali

Equazioni a derivate parziali *2010-06-14*

il testo costituisce una introduzione alla teoria delle equazioni a derivate parziali strutturata in modo da abituare il lettore ad una sinergia tra modellistica e aspetti teorici la prima parte riguarda le più note equazioni della fisica matematica idealmente raggruppate nelle tre macro aree diffusione propagazione e trasporto onde e vibrazioni nella seconda parte si presenta la formulazione variazionale dei principali problemi iniziali e o al bordo e la loro analisi con i metodi dell analisi funzionale negli spazi di hilbert

<u>Mathematical Analysis II</u> *2015-02-07*

the purpose of the volume is to provide a support textbook for a second lecture course on mathematical analysis the contents are organised to suit in particular students of engineering computer science and physics all areas in which mathematical tools play a crucial role the basic notions and methods concerning integral and differential calculus for multivariable functions series of functions and ordinary differential equations are presented in a manner that elicits critical reading and prompts a hands on approach to concrete applications the pedagogical layout echoes the one used in the companion text mathematical analysis i the book s structure has a specifically designed modular nature which allows for great flexibility in the preparation of a lecture course on mathematical analysis the style privileges clarity in the exposition and a linear progression through the theory the material is organised on two levels the first reflected in this book allows students to grasp the essential ideas familiarise with the corresponding key techniques and find the proofs of the main results the second level enables the strongly motivated reader to explore further into the subject by studying also the material contained in the appendices definitions are enriched by many examples which illustrate the properties discussed a host of solved exercises complete the text at least half of which guide the reader to the solution this new edition features additional

material with the aim of matching the widest range of educational choices for a second course of mathematical analysis

Computational Techniques and Applications: CTAC 95
1996-08-30

this proceedings contains seven invited papers and 100 contributed papers the topics covered range from studies of theoretical aspects of computational methods through to simulations of large scale industrial processes with an emphasis on the efficient use of computers to solve practical problems developers and users of computational techniques who wish to keep up with recent developments in the application of modern computational technology to problems in science and engineering will find much of interest in this volume contents some case studies in industrial mathematics f r de hoog n i robinson an inverse problem in environmental protection j m barry computational techniques for structural assessment of bridges t chalko et al a computationally fast method to model thin strip rolling a e dixon w y d yuen comparison of boundary element representations for potential fields m j drumm t g phemister on the computation of stability limits for fusion experiments p r garabedian h j gardner the finite lattice method of series expansions i jensen et al a comparison of finite difference and lagrangian stochastic

methods for oil slick tracking g d lewis et al numerical modelling techniques for simulating the microwave heating of polymer materials inside a ridge waveguide f liu i turner transport of mucus a h pincombe g d tansley iterative schemes for series solutions to laplacian free boundary problems w w read et al a systematic approach to calibrating hydrodynamic numerical models m d teubner et al computation of turbulent combustion flows with a finite element method z zhu n stokes and other papers readership scientists in numerical and computational methods applied mathematics computational physics supercomputing parallel processing and fluid mechanics keywords

Calcolo Scientifico *2012-11-19*

questo testo è concepito per i corsi delle facoltà di ingegneria e di scienze esso affronta tutti gli argomenti tipici della matematica numerica spaziando dal problema di approssimare una funzione al calcolo dei suoi zeri dei suoi minimi delle sue derivate e del suo integrale definito fino alla risoluzione di sistemi lineari e non lineari di equazioni differenziali ordinarie e alle derivate parziali con metodi alle differenze finite e agli elementi finiti un capitolo iniziale conduce lo studente ad un rapido ripasso degli argomenti dell analisi matematica di uso frequente nel volume e ad una introduzione ai linguaggi matlab e octave al fine di rendere maggiormente incisiva la presentazione e fornire un riscontro quantitativo immediato alla teoria

vengono implementati in linguaggio matlab e octave tutti gli algoritmi che via via si introducono vengono inoltre proposti numerosi esercizi tutti risolti per esteso ed esempi anche con riferimento ad applicazioni negli ambiti piu svariati

Algebra lineare ed equazioni differenziali ordinarie *2011-01-30*

si tratta di un testo avanzato suddiviso in due parti la prima fornisce strumenti dell algebra lineare nel caso finito dimensionale pensato con una prospettiva infinito dimensionale la seconda tratta di equazioni sistemi differenziali ordinari con particolare enfasi sulla stabilit dei punti di equilibrio e delle orbite periodiche non mancano applicazioni alle equazioni alle derivate parziali la prima parte pu essere utilizzata autonomamente mentre la seconda dipende in parte dai risultati esposti nella prima

Geometria Differenziale 2011-11-24

l opera fornisce una introduzione alla geometria delle varietà differenziabili illustrandone le principali proprietà e descrivendo le principali tecniche e i più importanti strumenti usati per il loro studio uno

degli obiettivi primari dell opera è di fungere da testo di riferimento per chi matematici fisici ingegneri usa la geometria differenziale come strumento inoltre può essere usato come libro di testo per diversi corsi introduttivi alla geometria differenziale concentrandosi su alcuni dei vari aspetti della teoria presentati nell opera più in dettaglio nell opera saranno trattati i seguenti argomenti richiami di algebra multilineare e tensoriale spesso non presentati nei corsi standard di algebra lineare varietà differenziali incluso il teorema di whitney fibrati vettoriali incluso il teorema di frobenius e un introduzione ai fibrati principali gruppi di lie incluso il teorema di corrispondenza fra sottogruppi e sottoalgebre coomologia di de rham inclusa la dualità di poincaré e il teorema di de rham connessioni inclusa la teoria delle geodetiche e geometria riemanniana con particolare attenzione agli operatori di curvatura e inclusi teoremi di cartan hadamard bonnet myers e synge weinstein come abitudine degli autori il testo è scritto in modo da favorire una lettura attiva cruciale per un buon apprendimento di argomenti matematici inoltre è corredato da numerosi esempi svolti ed esercizi proposti

Logica: Metodo Breve 2011-05-01

senza richiedere prerequisiti il testo si propone di fornire una dimostrazione dei fondamentali teoremi della logica matematica compattezza

completezza di gödel löwenheim skolem introducendo i concetti sintattici e semantici in modo progressivo dalla logica booleana a quella predicativa per facilitare la lettura attiva il testo contiene numerosi esercizi

Equazioni a derivate parziali *2006-07-25*

la presente raccolta di problemi ed esercizi nasce dall esperienza maturata durante il corso di equazioni a derivate parziali edped è rivolto prevalentemente a studenti di ingegneria fisica e matematica ma costituisce un utile punto di riferimento anche per coloro che desiderano approfondire alcuni aspetti teorici e modellistici di questa importante disciplina

Nonlinear Dynamics and Stochastic Mechanics *2018-05-04*

engineering systems have played a crucial role in stimulating many of the modern developments in nonlinear and stochastic dynamics after 20 years of rapid progress in these areas this book provides an overview of the current state of nonlinear modeling and analysis for mechanical and structural systems this volume is a coherent compendium written by leading experts from the united states canada western and eastern europe and australia the 22

articles describe the background recent developments applications and future directions in bifurcation theory chaos perturbation methods stochastic stability stochastic flows random vibrations reliability disordered systems earthquake engineering and numerics the book gives readers a sophisticated toolbox that will allow them to tackle modeling problems in mechanical systems that use stochastic and nonlinear dynamics ideas an extensive bibliography and index ensure this volume will remain a reference standard for years to come

Optimization and Approximation *2017-09-07*

this book provides a basic initial resource introducing science and engineering students to the field of optimization it covers three main areas mathematical programming calculus of variations and optimal control highlighting the ideas and concepts and offering insights into the importance of optimality conditions in each area it also systematically presents affordable approximation methods exercises at various levels have been included to support the learning process

Mathematical Modelling of the Human Cardiovascular System 2019-05-09

addresses the mathematical and numerical modelling of the human cardiovascular system from patient data to clinical applications

Reduced Basis Methods for Partial Differential Equations *2015-08-19*

this book provides a basic introduction to reduced basis rb methods for problems involving the repeated solution of partial differential equations pdes arising from engineering and applied sciences such as pdes depending on several parameters and pde constrained optimization the book presents a general mathematical formulation of rb methods analyzes their fundamental theoretical properties discusses the related algorithmic and implementation aspects and highlights their built in algebraic and geometric structures more specifically the authors discuss alternative strategies for constructing accurate rb spaces using greedy algorithms and proper orthogonal decomposition techniques investigate their approximation properties and analyze offline online decomposition strategies aimed at the reduction of

computational complexity furthermore they carry out both a priori and a posteriori error analysis the whole mathematical presentation is made more stimulating by the use of representative examples of applicative interest in the context of both linear and nonlinear pdes moreover the inclusion of many pseudocodes allows the reader to easily implement the algorithms illustrated throughout the text the book will be ideal for upper undergraduate students and more generally people interested in scientific computing all these pseudocodes are in fact implemented in a matlab package that is freely available at github com redbkit

Partial Differential Equations in Action *2015-05-30*

this textbook presents problems and exercises at various levels of difficulty in the following areas classical methods in pdes diffusion waves transport potential equations basic functional analysis and distribution theory variational formulation of elliptic problems and weak formulation for parabolic problems and for the wave equation thanks to the broad variety of exercises with complete solutions it can be used in all basic and advanced pde courses

Solving Hyperbolic Equations with Finite Volume Methods *2015-04-16*

finite volume methods are used in numerous applications and by a broad multidisciplinary scientific community the book communicates this important tool to students researchers in training and academics involved in the training of students in different science and technology fields the selection of content is based on the author s experience giving phd and master courses in different universities in the book the introduction of new concepts and numerical methods go together with simple exercises examples and applications that contribute to reinforce them in addition some of them involve the execution of matlab codes the author promotes an understanding of common terminology with a balance between mathematical rigor and physical intuition that characterizes the origin of the methods this book aims to be a first contact with finite volume methods once readers have studied it they will be able to follow more specific bibliographical references and use commercial programs or open source software within the framework of computational fluid dynamics cfd

Feynman Integrals *2022-06-11*

this textbook on feynman integrals starts from the basics requiring only knowledge of special relativity and undergraduate mathematics feynman integrals are indispensable for precision calculations in quantum field theory at the same time they are also fascinating from a mathematical point of view topics from quantum field theory and advanced mathematics are introduced as needed the book covers modern developments in the field of feynman integrals topics included are representations of feynman integrals integration by parts differential equations intersection theory multiple polylogarithms gelfand kapranov zelevinsky systems coactions and symbols cluster algebras elliptic feynman integrals and motives associated with feynman integrals this volume is aimed at a students at the master s level in physics or mathematics b physicists who want to learn how to calculate feynman integrals for whom state of the art techniques and computations are provided and c mathematicians who are interested in the mathematical aspects underlying feynman integrals it is indeed the interwoven nature of their physical and mathematical aspects that make feynman integrals so enthralling

A Primer on Mathematical Modelling *2020-10-09*

in this book we describe the magic world of mathematical models starting from real life problems we formulate them in terms of equations transform equations into algorithms and algorithms into programs to be executed on computers a broad variety of examples and exercises illustrate that properly designed models can e g predict the way the number of dolphins in the aeolian sea will change as food availability and fishing activity vary describe the blood flow in a capillary network calculate the pagerank of websites this book also includes a chapter with an elementary introduction to octave an open source programming language widely used in the scientific community octave functions and scripts for dealing with the problems presented in the text can be downloaded from paola gervasio unibs it quarteroni gervasio this book is addressed to any student interested in learning how to construct and apply mathematical models

Deutsche Nationalbibliographie und Bibliographie der im Ausland erschienenen deutschsprachigen

<u>Veröffentlichungen</u> *1996*

il presente testo è concepito con l obiettivo di venire incontro all evoluzione subita dai corsi di meccanica razionale sia in termini di organizzazione che di contenuti i concetti fondamentali vengono così introdotti a partire da esempi e problemi concreti anche comuni ad altre discipline in vista di sinergie didattiche a volte favorite dalla presenza di corsi integrati questa impostazione è particolarmente marcata nelle sezioni tradizionalmente caratterizzate da una trattazione forse più astratta dai vincoli al principio dei lavori virtuali dal principio di d alembert alla meccanica analitica questa seconda edizione rinforza consistentemente il numero di esempi ed esercizi svolti tali esempi che non intendono coprire il ventaglio completo di applicazioni che normalmente vengono mostrate agli studenti durante le esercitazioni dei corsi di meccanica razionale accompagnano l allievo nell apprendimento dei concetti teorici mostrandone immediatamente le loro applicazioni concrete

Meccanica Razionale *2014-11-18*

a partire dagli studi sulla prospettiva degli artisti del rinascimento la geometria proiettiva si è sviluppata nei secoli successivi come disciplina

autonoma che oltre ad essere alla base della geometria algebrica classica trova applicazioni in numerosi settori dall ingegneria alla computer vision dall architettura alla crittografia la prima parte di questo testo contiene richiami sintetici ma rigorosi delle nozioni fondamentali di geometria proiettiva in un linguaggio semplice e moderno ciò offre al lettore una rapida visione d insieme della materia trattata e lo introduce alle tecniche e alle notazioni successivamente adoperate nella seconda parte sono presentati più di 200 problemi risolti per molti dei quali si propongono più soluzioni alternative il livello di difficoltà è variabile si spazia da esercizi di carattere calcolativo a problemi più impegnativi di carattere teorico fino a veri e propri teoremi con dimostrazione guidata la struttura del testo consente al lettore di utilizzare la risoluzione degli esercizi per impadronirsi delle nozioni e delle tecniche di base e per progredire nella conoscenza della materia fino allo studio di alcuni risultati classici

Geometria proiettiva 2011-03-29

nato dall esperienza dell autore nell insegnamento della topologia agli studenti del corso di laurea in matematica questo libro contiene le nozioni fondamentali di topologia generale ed una introduzione alla topologia algebrica la scelta degli argomenti il loro ordine di presentazione e soprattutto il tipo di esposizione tiene conto delle tendenze attuali nell

insegnamento della topologia e delle novita nella struttura dei corsi di laurea scientifici conseguenti all introduzione del sistema 3 2 questa seconda edizione oltre a semplificare alcune dimostrazioni presenta una sostanziale riscrittura della parte sui rivestimenti e l aggiunta di ulteriori esempi il numero complessivo di esercizi proposti stato portato a 500 ed il numero di quelli svolti a 120

Topologia *2014-04-12*

this self contained and comprehensive textbook of algebraic number theory is useful for advanced undergraduate and graduate students of mathematics the book discusses proofs of almost all basic significant theorems of algebraic number theory including dedekind s theorem on splitting of primes dirichlet s unit theorem minkowski s convex body theorem dedekind s discriminant theorem hermite s theorem on discriminant dirichlet s class number formula and dirichlet s theorem on primes in arithmetic progressions a few research problems arising out of these results are mentioned together with the progress made in the direction of each problem following the classical approach of dedekind s theory of ideals the book aims at arousing the reader s interest in the current research being held in the subject area it not only proves basic results but pairs them with recent developments making the book relevant and thought provoking historical notes are given at various places

featured with numerous related exercises and examples this book is of significant value to students and researchers associated with the field the book also is suitable for independent study the only prerequisite is basic knowledge of abstract algebra and elementary number theory

A Textbook of Algebraic Number Theory 2022-04-26

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