

Solution Manual Perko Differential Equations And Dynamical

Knots are familiar objects. We use them to moor our boats, to wrap our packages, to tie our shoes. Yet the mathematics of knots quickly leads to deep results in topology and geometry. The Knot Book is an introduction to this rich theory, starting with our familiar understanding of knots and a bit of college algebra and finishing with exciting topics of current research. The Knot Book is also about the excitement of doing mathematics. Colin Adams engages the reader with fascinating examples, figures, and thought-provoking ideas. He also presents the remarkable applications of knot theory to modern chemistry and physics. This is a compelling book that will comfortably escort you into the marvelous world of knot theory. Whether you are a mathematics student, someone working in a related field, or an amateur mathematician, you will find much of interest in the Knot Book.

This textbook is aimed at newcomers to nonlinear dynamics and chaos, especially students taking a first course in the subject. The presentation stresses analytical methods, concrete examples, and geometric intuition. The theory is developed systematically, starting with first-order differential equations and their bifurcations, followed by phase plane analysis, limit cycles and bifurcations, and culminating with the Lorenz equations, chaos, iterated maps, period doubling, renormalization, fractals, and strange attractors.

Mathematical Modeling: Models, Analysis and Applications, Second Edition introduces models of both discrete and continuous systems. This book is aimed at newcomers who desire to learn mathematical modeling, especially students taking a first course in the subject. Beginning with the step-by-step guidance of model formulation, this book equips the reader about modeling with difference equations (discrete models), ODE's, PDE's, delay and stochastic differential equations (continuous models). The book provides interdisciplinary and integrative overview of mathematical modeling, making it a complete textbook for a wide audience. A unique feature of the book is the breadth of coverage of different examples on mathematical modelling, which include population models, economic models, arms race models, combat models, learning model, alcohol dynamics model, dating, drug distribution models, mechanical oscillation models, epidemic models, tumor models, traffic flow models, predator-prey models, spatial models, football team performance model, breathing model, two neuron system model, zombie model, and love affairs. Common themes such as equilibrium points, stability, phase plane analysis, bifurcations, limit cycles, period doubling, and chaos run through several chapters and their interpretations in the context of the model have been highlighted. A section on estimation of system parameters with real life data for model validation has also been discussed. Features include discrete, continuous, spatial, delayed and stochastic models. Over 250 illustrations, 300 examples and exercises with solutions. Incorporates MATHEMATICA® and MATLAB®, each chapter contains Mathematica and Matlab codes used to generate and display numerical results (available at CRC website). Separate sections for Projects. Several exercise problems can be used for projects. Presents real life examples of discrete and continuous scenarios. The book is ideal for an introductory course for undergraduate and graduate students, engineers, applied mathematicians and researchers working in various areas of science and applied sciences.

This book presents a mathematically-based introduction into the fascinating topic of Fuzzy Sets and Fuzzy Logic and can be used as textbook at both undergraduate and graduate levels and also as reference guide for mathematician, scientist, and engineer who would like to get an insight into Fuzzy Logic. Fuzzy Sets have been introduced by Lotfi Zadeh in 1965 and since then they have been used in many applications. As a consequence, there is a vast literature on the practical applications of fuzzy logic. The theory has a more modest coverage. The main purpose of the present book is to reduce this gap by providing a theoretical foundation. Well-known applications, as for example fuzzy control, are also discussed in this book and placed on new ground, a theoretical foundation. Moreover, advanced chapters and several new results are included. These comprise, among others, a new systematic and consistent approach for fuzzy inference systems of Mamdani and Takagi-Sugeno types, that investigates their approximation capabilities, providing new error estimates.

Student Solutions Manual for Nonlinear Dynamics and Chaos, 2nd edition

Qualitative Theory

Qualitative Theory of Planar Differential Systems

An Elementary Introduction to the Mathematical Theory of Knots

Differential Equations and Their Applications

Based on a one-year course taught by the author to graduates at the University of Missouri, this book provides a student-friendly account of some of the standard topics encountered in an introductory course of ordinary differential equations. In a second semester, these ideas can be expanded by introducing more advanced concepts and applications. A central theme in the book is the use of the Implicit Function Theorem, while the latter sections of the book introduce the basic ideas of perturbation theory as applications of this Theorem. The book also contains material differing from standard treatments, for example, the Fiber Contraction Principle is used to prove the smoothness of functions that are obtained as fixed points of contractions. The ideas introduced in this section can be extended to infinite dimensions.

This book provides a complete analysis of those subjects that are of fundamental importance to the qualitative theory of differential equations and related to current research—including details that other books in the field tend to overlook. Chapters 1–7 cover the basic qualitative properties concerning existence and uniqueness, structures of solutions, phase portraits, stability, bifurcation and chaos. Chapters 8–12 cover stability, dynamical systems, and bounded and periodic solutions. A good reference book for teachers, researchers, and other professionals.

Differential equations arise in a variety of contexts, some purely theoretical and some of practical interest. As you read this textbook, you will find that the qualitative and quantitative study of differential equations incorporates an elegant blend of linear algebra and advanced calculus. This book is intended for an advanced undergraduate course in differential equations. The reader should have already completed courses in linear algebra, multivariable calculus, and introductory differential equations.

This book provides a self-contained introduction to ordinary differential equations and dynamical systems suitable for beginning graduate students. The first part begins with some simple examples of explicitly solvable equations and a first glance at qualitative methods. Then the

fundamental results concerning the initial value problem are proved: existence, uniqueness, extensibility, dependence on initial conditions. Furthermore, linear equations are considered, including the Floquet theorem, and some perturbation results. As somewhat independent topics, the Frobenius method for linear equations in the complex domain is established and Sturm-Liouville boundary value problems, including oscillation theory, are investigated. The second part introduces the concept of a dynamical system. The Poincaré-Bendixson theorem is proved, and several examples of planar systems from classical mechanics, ecology, and electrical engineering are investigated. Moreover, attractors, Hamiltonian systems, the KAM theorem, and periodic solutions are discussed. Finally, stability is studied, including the stable manifold and the Hartman-Grobman theorem for both continuous and discrete systems. The third part introduces chaos, beginning with the basics for iterated interval maps and ending with the Smale-Birkhoff theorem and the Melnikov method for homoclinic orbits. The text contains almost three hundred exercises. Additionally, the use of mathematical software systems is incorporated throughout, showing how they can help in the study of differential equations.

An Introduction to Applied Mathematics

A First Course in the Qualitative Theory of Differential Equations

Differential Dynamical Systems, Revised Edition

Dynamical Systems with Applications using MATLAB®

Differential Equations and Dynamical Systems

Delay Differential Equations: Recent Advances and New Directions cohesively presents contributions from leading experts on the theory and applications of functional and delay differential equations (DDEs). Students and researchers will benefit from a unique focus on theory, symbolic, and numerical methods, which illustrate how the concepts described can be applied to practical systems ranging from automotive engines to remote control over the Internet. Comprehensive coverage of recent advances, analytical contributions, computational techniques, and illustrative examples of the application of current results drawn from biology, physics, mechanics, and control theory. Students, engineers and researchers from various scientific fields will find Delay Differential Equations: Recent Advances and New Directions a valuable reference.

Science for Policy Handbook provides advice on how to bring science to the attention of policymakers. This resource is dedicated to researchers and research organizations aiming to achieve policy impacts. The book includes lessons learned along the way, advice on new skills, practices for individual researchers, elements necessary for institutional change, and knowledge areas and processes in which to invest. It puts co-creation at the centre of Science for Policy 2.0, a more integrated model of knowledge-policy relationship. Covers the vital area of science for policymaking Includes contributions from leading practitioners from the Joint Research Centre/European Commission Provides key skills based on the science-policy interface needed for effective evidence-informed policymaking Presents processes of knowledge production relevant for a more holistic science-policy relationship, along with the types of knowledge that are useful in policymaking

In order to check the validity of the approximations, we numerically integrated the original differential delay equations for the case $\epsilon=1$ and $t=0.1$ and compared their predictions regarding the stability of the in-phase and out-of-phase modes with those of the slow-flow analysis. The two sets of results showed excellent agreement.

This book deals with systems of polynomial autonomous ordinary differential equations in two real variables. The emphasis is mainly qualitative, although attention is also given to more algebraic aspects as a thorough study of the center/focus problem and recent results on integrability. In the last two chapters the performant software tool P4 is introduced. From the start, differential systems are represented by vector fields enabling, in full strength, a dynamical systems approach. All essential notions, including invariant manifolds, normal forms, desingularization of singularities, index theory and limit cycles, are introduced and the main results are proved for smooth systems with the necessary specifications for analytic and polynomial systems.

Dynamical Systems and Control

Applications to Civil, Mechanical and Chemical Engineering

Fundamentals of Engineering Numerical Analysis

Exercise and Cognitive Function

Numerical computing with IEEE floating point arithmetic

This title provides an easily accessible yet detailed discussion of IEEE Std 754-1985, arguably the most important standard in the computer industry. The result of an unprecedented cooperation between academic computer scientists and the cutting edge of industry, it is supported by virtually every modern computer. Other topics include the floating point architecture of the Intel microprocessors and a discussion of programming language support for the standard.

This textbook, now in its second edition, provides a broad introduction to both continuous and discrete dynamical systems, the theory of which is motivated by examples from a wide range of disciplines. It emphasizes applications and simulation utilizing MATLAB®, Simulink®, the Image Processing Toolbox® and the Symbolic Math toolbox®, including MuPAD. Features new to the second edition include · sections on series solutions of ordinary differential equations, perturbation methods, normal forms, Gröbner bases, and chaos synchronization; · chapters on image processing and binary oscillator computing; · hundreds of new illustrations, examples, and exercises with solutions; and · over eighty up-to-date MATLAB program files and Simulink model files available online. These files were voted MATLAB Central Pick of the Week in July 2013. The hands-on approach of Dynamical Systems with Applications using MATLAB, Second Edition, has minimal prerequisites, only requiring familiarity with ordinary differential equations. It will appeal to advanced undergraduate and graduate students, applied mathematicians, engineers, and researchers in a broad range of disciplines such as population dynamics, biology, chemistry, computing, economics, nonlinear optics, neural networks, and physics. Praise for the first edition Summing up, it can be said that this text allows the reader to have an easy and quick start to the huge field of dynamical systems theory. MATLAB/SIMULINK facilitate this approach under the aspect of learning by doing. —OR News/Operations Research Spectrum The MATLAB programs are kept as simple as possible and the author's experience has shown that this method of teaching using MATLAB works well with computer laboratory classes of small sizes.... I recommend 'Dynamical Systems with Applications using MATLAB' as a good handbook for a diverse readership: graduates and professionals in mathematics, physics, science and engineering. —Mathematica

Foreword by Walter J. Freeman. The induction of unconsciousness using anesthetic agents demonstrates that the cerebral cortex can operate in two very different behavioral modes: alert and responsive vs. unaware and quiescent. But the states of wakefulness and sleep are not single-neuron properties---they emerge as bulk properties of cooperating populations of neurons, with the switchover between states being similar to the physical change of phase observed when water freezes or ice melts. Some brain-state transitions, such as sleep cycling, anesthetic induction, epileptic seizure, are obvious and detected readily with a few EEG electrodes; others, such as the emergence of gamma rhythms during cognition, or the ultra-slow BOLD rhythms of relaxed free-association, are much more subtle. The unifying theme of this book is the notion that all of these bulk changes in brain behavior can be treated as phase transitions between distinct brain states. Modeling Phase Transitions in the Brain contains chapter contributions from leading researchers who apply state-space methods, network models, and biophysically-motivated continuum approaches to investigate a range of neuroscientifically relevant problems that

include analysis of nonstationary EEG time-series; network topologies that limit epileptic spreading; saddle--node bifurcations for anesthesia, sleep-cycling, and the wake--sleep switch; prediction of dynamical and noise-induced spatiotemporal instabilities underlying BOLD, alpha-, and gamma-band Hopf oscillations, gap-junction-moderated Turing structures, and Hopf-Turing interactions leading to cortical waves.

This official Student Solutions Manual includes solutions to the odd-numbered exercises featured in the second edition of Steven Strogatz's classic text Nonlinear Dynamics and Chaos: With Applications to Physics, Biology, Chemistry, and Engineering. The textbook and accompanying Student Solutions Manual are aimed at newcomers to nonlinear dynamics and chaos, especially students taking a first course in the subject. Complete with graphs and worked-out solutions, this manual demonstrates techniques for students to analyze differential equations, bifurcations, chaos, fractals, and other subjects Strogatz explores in his popular book.

An Introduction to Ordinary Differential Equations

ICRRM 2019 – System Reliability, Quality Control, Safety, Maintenance and Management

Models, Analysis and Applications

Advances in Meshfree Techniques

With Applications to Physics, Biology, Chemistry, and Engineering, Second Edition

This student solutions manual accompanies the text, Boundary Value Problems and Partial Differential Equations, 5e. The SSM is available in print via PDF or electronically, and provides the student with the detailed solutions of the odd-numbered problems contained throughout the book. Provides students with exercises that skillfully illustrate the techniques used in the text to solve science and engineering problems Nearly 900 exercises ranging in difficulty from basic drills to advanced problem-solving exercises Many exercises based on current engineering applications

Homework help! Worked-out solutions to select problems in the text.

This book presents a variety of techniques for solving ordinary differential equations analytically and features a wealth of examples. Focusing on the modeling of real-world phenomena, it begins with a basic introduction to differential equations, followed by linear and nonlinear first order equations and a detailed treatment of the second order linear equations. After presenting solution methods for the Laplace transform and power series, it lastly presents systems of equations and offers an introduction to the stability theory. To help readers practice the theory covered, two types of exercises are provided: those that illustrate the general theory, and others designed to expand on the text material. Detailed solutions to all the exercises are included. The book is excellently suited for use as a textbook for an undergraduate class (of all disciplines) in ordinary differential equations.

Differential equations are the basis for models of any physical systems that exhibit smooth change. This book combines much of the material found in a traditional course on ordinary differential equations with an introduction to the more modern theory of dynamical systems. Applications of this theory to physics, biology, chemistry, and engineering are shown through examples in such areas as population modeling, fluid dynamics, electronics, and mechanics. Differential Dynamical Systems begins with coverage of linear systems, including matrix algebra; the focus then shifts to foundational material on nonlinear differential equations, making heavy use of the contraction-mapping theorem. Subsequent chapters deal specifically with dynamical systems concepts?flow, stability, invariant manifolds, the phase plane, bifurcation, chaos, and Hamiltonian dynamics. This new edition contains several important updates and revisions throughout the book. Throughout the book, the author includes exercises to help students develop an analytical and geometrical understanding of dynamics. Many of the exercises and examples are based on applications and some involve computation; an appendix offers simple codes written in Maple?, Mathematica?, and MATLAB? software to give students practice with computation applied to dynamical systems problems.

Noise and Randomness in Living System

Student Solutions Manual

Optimization in Control Applications

The Dynamics of Two Coupled Van Der Pol Oscillators with Delay Coupling

Ordinary Differential Equations

This introduction to applied nonlinear dynamics and chaos places emphasis on teaching the techniques and ideas that will enable students to take specific dynamical systems and obtain some quantitative information about their behavior. The new edition has been updated and extended throughout, and contains a detailed glossary of terms. From the reviews: "Will serve as one of the most eminent introductions to the geometric theory of dynamical systems." --Monatshefte für Mathematik

Game theory is the theory of social situations, and the majority of research into the topic focuses on how groups of people interact by developing formulas and algorithms to identify optimal strategies and to predict the outcome of interactions. Only fifty years old, it has already revolutionized economics and finance, and is spreading rapidly to a wide variety of fields. LQ Dynamic Optimization and Differential Games is an assessment of the state of the art in its field and the first modern book on linear-quadratic game theory, one of the most commonly used tools for modelling and analysing strategic decision making problems in economics and management. Linear quadratic dynamic models have a long tradition in economics, operations research and control engineering; and the author begins by describing the one-decision maker LQ dynamic optimization problem before introducing LQ differential games. Covers cooperative and non-cooperative scenarios, and treats the standard information structures (open-loop and feedback). Includes real-life economic examples to illustrate theoretical concepts and results. Presents problem formulations and sound mathematical problem analysis. Includes exercises and solutions, enabling use for self-study or as a course text. Supported by a website featuring solutions to exercises, further examples and computer code for numerical examples. LQ Dynamic Optimization and Differential Games offers a comprehensive introduction to the theory and practice of this extensively used class of economic models, and will appeal to applied mathematicians and econometricians as well as researchers and senior undergraduate/graduate students in economics, mathematics, engineering and management science.

Mathematics is playing an ever more important role in the physical and biological sciences, provoking a blurring of boundaries between scientific disciplines and a resurgence of interest in the modern as well as the classical techniques of applied mathematics. This renewal of interest, both in research and teaching, has led to the establishment of the series: Texts in Applied Mathematics (TAM). The development of new courses is a natural

consequence of a high level of excitement on the research frontier as newer techniques, such as numerical and symbolic computer systems, dynamical systems, and chaos, mix with and reinforce the traditional methods of applied mathematics. Thus, the purpose of this textbook series is to meet the current and future needs of these advances and encourage the teaching of new courses. TAM will publish textbooks suitable for use in advanced undergraduate and beginning graduate courses, and will complement the Applied Mathematical Sciences (AMS) series, which will focus on advanced textbooks and research level monographs. Preface to the Second Edition This book covers those topics necessary for a clear understanding of the qualitative theory of ordinary differential equations and the concept of a dynamical system. It is written for advanced undergraduates and for beginning graduate students. It begins with a study of linear systems of ordinary differential equations, a topic already familiar to the student who has completed a first course in differential equations.

For the past several years the Division of Applied Mathematics at Brown University has been teaching an extremely popular sophomore level differential equations course. The immense success of this course is due primarily to two factors. First, and foremost, the material is presented in a manner which is rigorous enough for our mathematics and applied mathematics majors, but yet intuitive and practical enough for our engineering, biology, economics, physics and geology majors. Secondly, numerous case histories are given of how researchers have used differential equations to solve real life problems. This book is the outgrowth of this course. It is a rigorous treatment of differential equations and their applications, and can be understood by anyone who has had a two semester course in Calculus. It contains all the material usually covered in a one or two semester course in differential equations. In addition, it possesses the following unique features which distinguish it from other textbooks on differential equations.

Nonlinear Dynamics and Chaos

Differential Equations: Methods and Applications

Recent Advances and New Directions

Modeling Phase Transitions in the Brain

Mathematics of Fuzzy Sets and Fuzzy Logic

This book introduces the study of knots, providing insights into recent applications in DNA research and graph theory. It sets forth fundamental facts such as knot diagrams, braid representations, Seifert surfaces, tangles, and Alexander polynomials. It also covers more recent developments and special topics, such as chord diagrams and covering spaces. The author avoids advanced mathematical terminology and intricate techniques in algebraic topology and group theory. Numerous diagrams and exercises help readers understand and apply the theory. Each chapter includes a supplement with interesting historical and mathematical comments.

Since the original publication of this book, available computer power has increased greatly. Today, scientific computing is playing an ever more prominent role as a tool in scientific discovery and engineering analysis. In this second edition, the key addition is an introduction to the finite element method. This is a widely used technique for solving partial differential equations (PDEs) in complex domains. This text introduces numerical methods and shows how to develop, analyse, and use them. Complete MATLAB programs for all the worked examples are now available at www.cambridge.org/Moin, and more than 30 exercises have been added. This thorough and practical book is intended as a first course in numerical analysis, primarily for new graduate students in engineering and physical science. Along with mastering the fundamentals of numerical methods, students will learn to write their own computer programs using standard numerical methods.

Content of this proceedings discusses emerging trends in structural reliability, safety and disaster management, covering topics like total quality management, risk maintenance and design for reliability. Some papers also address chemical process reliability, reliability analysis and engineering applications in chemical process equipment systems and includes a chapter on reliability evaluation models of chemical systems. Accepted papers from 2019 International Conference on Reliability, Risk Maintenance and Engineering Management (ICRRM 2019) are part of this conference proceeding. It offers useful insights to road safety engineers, disaster management professionals involved in product design and probabilistic methods in manufacturing systems.

This book distinguishes itself from the many other textbooks on the topic of linear algebra by including mathematical and computational chapters along with examples and exercises with Matlab. In recent years, the use of computers in many areas of engineering and science has made it essential for students to get training in numerical methods and computer programming. Here, the authors use both Matlab and SciLab software as well as covering core standard material. It is intended for libraries; scientists and researchers; pharmaceutical industry.

Ordinary Differential Equations and Dynamical Systems

Knot Theory and Its Applications

Mathematical Modeling

Ordinary Differential Equations with Applications

Introduction to Applied Nonlinear Dynamical Systems and Chaos

A thorough, systematic first course in elementary differential equations for undergraduates in mathematics and science, requiring only basic calculus for a background. Includes many exercises and problems, with answers. Index.

This book has been designed for Undergraduate (Honours) and Postgraduate students of various Indian Universities. A set of objective problems has been provided at the end of each chapter which will be useful to the aspirants of competitive examinations

This textbook presents a systematic study of the qualitative and geometric theory of nonlinear differential equations and dynamical systems. Although the main topic of the book is the local and global behavior of nonlinear systems and their bifurcations, a thorough treatment of linear systems is given at the beginning of the text. All the material necessary for a clear understanding of the qualitative behavior of dynamical systems is contained in this textbook, including an outline of the proof and examples illustrating the proof of the Hartman-Grobman theorem. In addition to minor corrections and updates throughout, this new edition includes materials on higher order Melnikov theory and the bifurcation of limit cycles for planar systems of differential equations.

The 11th International Workshop on Dynamics and Control brought together scientists and engineers from diverse fields and gave them a venue to develop a greater understanding of this discipline and how it relates to many areas in science, engineering, economics, and biology. The event gave researchers an opportunity to investigate ideas and techniques

Boundary Value Problems and Partial Differential Equations

Science for Policy Handbook

Understanding Nonlinear Dynamics

Nonlinear Dynamics and Chaos with Student Solutions Manual

With Applications to Physics, Biology, Chemistry, and Engineering

The book collects extended original contributions presented at the first ECCOMAS Conference on Meshless Methods held in 2005 in Lisbon. The list of contributors is a mix of highly distinguished authors as well as promising young researchers. This means that the reader gets a varied and contemporary view on different mesh reduction methods and its range of applications. The material presented is appropriate for researchers, engineers, physicists, applied mathematicians and graduate students interested in this active research area.

This textbook focuses on the relationship between physical exercise and cognition, a very timely and important topic with major theoretical and practical implications for a number of areas including ageing, neurorehabilitation, depression and dementia. It brings together a wide range of analytical approaches and experimental results to provide a very useful overview and synthesis of this growing field of study. The book is divided into three parts: Part I covers the conceptual, theoretical and methodological underpinnings and issues. Part II focuses on advances in exercise and cognition research, with appropriate sub-sections on 'acute' and 'chronic' exercise and cognition. Part III presents an overview of the area and makes suggestions for the direction of future research. This text provides a cutting-edge examination of this increasingly important area written by leading experts from around the world. The book will prove invaluable to researchers and practitioners in a number of fields, including exercise science, cognitive science, neuroscience and clinical medicine. Key Features: Unique in-depth investigation of the relationship between physical exercise and brain function. Covers theoretical approaches and experimental results and includes chapters on the latest developments in research design. Examines the effects of both acute and chronic exercise on brain function. International list of contributors, who are leading researchers in their field.

This textbook provides a comprehensive introduction to the qualitative theory of ordinary differential equations. It includes a discussion of the existence and uniqueness of solutions, phase portraits, linear equations, stability theory, hyperbolicity and equations in the plane. The emphasis is primarily on results and methods that allow one to analyze qualitative properties of the solutions without solving the equations explicitly. The text includes numerous examples that illustrate in detail the new concepts and results as well as exercises at the end of each chapter. The book is also intended to serve as a bridge to important topics that are often left out of a course on ordinary differential equations. In particular, it provides brief introductions to bifurcation theory, center manifolds, normal forms and Hamiltonian systems.

This book is a printed edition of the Special Issue "Optimization in Control Applications" that was published in MCA

Numerical Linear Algebra

The Knot Book

Elementary Differential Equations

LQ Dynamic Optimization and Differential Games

Ordinary and Partial Differential Equations

Mathematics is playing an ever more important role in the physical and biological sciences, provoking a blurring of boundaries between scientific disciplines and a resurgence of interest in the modern as well as the classical techniques of applied mathematics. This renewal of interest, both in research and teaching, has led to the establishment of the series: Texts in Applied Mathematics (TAM). The development of new courses is a natural consequence of a high level of excitement on the research frontier as newer techniques, such as numerical and symbolic computer systems, dynamical systems, and chaos, mix with and reinforce the traditional methods of applied mathematics. Thus, the purpose of this textbook series is to meet the current and future needs of these advances and encourage the teaching of new courses. TAM will publish textbooks suitable for use in advanced undergraduate and beginning graduate courses, and will complement the Applied Mathematical Sciences (AMS) series, which will focus on advanced textbooks and research level monographs. About the Authors Daniel Kaplan specializes in the analysis of data using techniques motivated by nonlinear dynamics. His primary interest is in the interpretation of irregular physiological rhythms, but the methods he has developed have been used in geo physics, economics, marine ecology, and other fields. He joined McGill in 1991, after receiving his Ph.D from Harvard University and working at MIT. His undergraduate studies were completed

at Swarthmore College. He has worked with several instrumentation companies to develop novel types of medical monitors.
Delay Differential Equations