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KEY=WITH - KIERA DORSEY

Variational Calculus with Elementary Convexity

Springer Science & Business Media The calculus of variations, whose origins can be traced to the works of Aristotle and Zenodoros, is now Ii vast repository supplying fundamental tools of exploration not only to the mathematician, but-as evidenced by current literature-also to those in most branches of science in which mathematics is applied. (Indeed, the macroscopic statements afforded by variational principles may provide the only valid mathematical formulation of many physical laws.) As such, it retains the spirit of natural philosophy common to most mathematical investigations prior to this century. How ever, it is a discipline in which a single symbol (b) has at times been assigned almost mystical powers of operation and discernment, not readily subsumed into the formal structures of modern mathematics. And it is a field for which it is generally supposed that most questions motivating interest in the subject will probably not be answerable at the introductory level of their formulation. In earlier articles,1,2 it was shown through several examples that a complete characterization of the solution of optimization problems may be available by elementary methods, and it is the purpose of this work to explore further the convexity which underlay these individual successes in the context of a full introductory treatment of the theory of the variational calculus. The required convexity is that determined through Gateaux variations, which can be defined in any real linear space and which provide an unambiguous foundation for the theory.

Undergraduate Convexity

From Fourier and Motzkin to Kuhn and Tucker

World Scientific Based on undergraduate teaching to students in computer science, economics and mathematics at Aarhus University, this is an elementary introduction to convex sets and convex functions with emphasis on concrete computations and examples. Starting from linear inequalities and Fourier–Motzkin elimination, the theory is developed by introducing polyhedra, the double description method and the simplex algorithm, closed convex subsets, convex functions of one and several variables ending with a chapter on convex optimization with the Karush–Kuhn–Tucker conditions, duality and an interior point algorithm. Contents:Fourier–Motzkin Elimination Affine SubspacesConvex SubsetsPolyhedraComputations with PolyhedraClosed Convex Subsets and Separating HyperplanesConvex FunctionsDifferentiable Functions of Several VariablesConvex Functions of Several VariablesConvex OptimizationAppendices:AnalysisLinear (In)dependence and the Rank of a Matrix Readership: Undergraduates focusing on convexity and optimization. Keywords:Convex Sets;Covex Functions;Fourierâ□□Motzkin Eliminination;Karushâ□□Kuhnâ□□Tucker Conditions;Quadratic OptimizationKey Features:Emphasis on viewing introductory convexity as a generalization of linear algebra in finding solutions to linear inequalitiesA key point is computation through concrete algorithms like the double description method. This enables students to carry out non-trivial computations alongside the introduction of the mathematical conceptsConvexity is inherently a geometric subject. However, without computational techniques, the teaching of the subject turns easily into a reproduction of abstractions and definitions. The book addresses this issue at a basic levelReviews: “Overall, the author has managed to keep a sound balance between the different approaches to convexity in geometry, analysis, and applied mathematics. The entire presentation is utmost lucid, didactically well-composed, thematically versatile and essentially self-contained. The large number of instructive examples and illustrating figures will certainly help the unexperienced reader grasp the abstract concepts, methods and results, all of which are treated in a mathematically rigorous way. Also, the emphasis on computational, especially algorithmic methods is a particular feature of this fine undergraduate textbook, which will be a great source for students and instructors like-wise ... the book under review is an excellent, rather unique primer on convexity in several branches of mathematics.” Zentralblatt MATH “Undergraduate Convexity would make an excellent textbook. An instructor might choose to have students present some of the examples while he or she provides commentary, perhaps alternating coaching and lecturing. A course taught from this book could be a good transition into more abstract mathematics, exposing students to general theory then giving them the familiar comfort of more computational exercises. One could also use the book as a warm-up to a more advanced course in optimization.” MAA Review “The book is didactically written in a pleasant and lively style, with careful motivation of the considered notions, illuminating examples and pictures, and relevant historical remarks. This is a remarkable book, a readable and attractive introduction to the multi-faceted domain of convexity and its applications.” Nicolae Popovici Stud. Univ. Babes-Bolyai Math “Compared to most modern undergraduate math textbooks, this book is unusually thin and portable. It also contains a wealth of material, presented in a concise and delightful way, accompanied by figures, historical references, pointers to further reading, pictures of great mathematicians and snapshots of pages of their groundbreaking papers. There are numerous exercises, both of computational and theoretical nature. If you want to teach an undergraduate convexity course, this looks like an excellent choice for the textbook.” MathSciNet

Variational Calculus and Optimal Control

Optimization with Elementary Convexity

Springer An introduction to the variational methods used to formulate and solve mathematical and physical problems, allowing the reader an insight into the systematic use of elementary (partial) convexity of differentiable functions in Euclidian space. By helping students directly characterize the solutions for many minimization problems, the text serves as a prelude to the field theory for sufficiency, laying as it does the groundwork for further explorations in mathematics, physics, mechanical and electrical engineering, as well as computer science.

Variational Calculus and Optimal Control

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Basic Monotonicity Methods with Some Applications

Springer Nature This textbook introduces some basic tools from the theory of monotone operators together with some of their applications. Examples that work for ordinary differential equations are provided. The illustrating material is kept relatively simple, while at the same time offering inspiring applications to the reader. The material will appeal to graduate students in mathematics who want to learn some basics in the theory of monotone operators. Furthermore, it offers a smooth transition to studying more advanced topics pertaining to more refined applications by shifting to pseudomonotone operators, and next, to multivalued monotone operators.

Undergraduate Algebra

Springer Science & Business Media The companion title, Linear Algebra, has sold over 8,000 copies The writing style is very accessible The material can be covered easily in a one-year or one-term course Includes Noah Snyder's proof of the Mason-Stothers polynomial abc theorem New material included on product structure for matrices including descriptions of the conjugation representation of the diagonal group

A First Course in Analysis

Springer Science & Business Media This text on advanced calculus discusses such topics as number systems, the extreme value problem, continuous functions, differentiation, integration and infinite series. The reader will find the focus of attention shifted from the learning and applying of computational techniques to careful reasoning from hypothesis to conclusion. The book is intended both for a terminal course and as preparation for more advanced studies in mathematics, science, engineering and computation.

Optimization and Approximation

Springer 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.

A Course in Modern Geometries

Springer Science & Business Media A Course in Modern Geometries is designed for a junior-senior level course for mathematics majors, including those who plan to teach in secondary school. Chapter 1 presents several finite geometries in an axiomatic framework. Chapter 2 introduces Euclid's geometry and the basic ideas of non-Euclidean geometry. The synthetic approach of Chapters 1 - 2 is followed by the analytic treatment of transformations of the Euclidean plane in Chapter 3. Chapter 4 presents plane projective geometry both synthetically and analytically. The extensive use of matrix representations of groups of transformations in Chapters 3 - 4 reinforces ideas from linear algebra and serves as excellent preparation for a course in abstract algebra. Each chapter includes a list of suggested sources for applications and/or related topics.

Ideals, Varieties, and Algorithms

An Introduction to Computational Algebraic Geometry and Commutative Algebra

Springer Science & Business Media Written at a level appropriate to undergraduates, this book covers such topics as the Hilbert Basis Theorem, the Nullstellensatz, invariant theory, projective geometry, and dimension theory. Contains a new section on Axiom and an update about MAPLE, Mathematica and REDUCE.

Geometric Control of Mechanical Systems

Modeling, Analysis, and Design for Simple Mechanical Control Systems

Springer The area of analysis and control of mechanical systems using differential geometry is flourishing. This book collects many results over the last decade and provides a comprehensive introduction to the area.

A Variational Approach to Optimal Control of ODEs

SIAM This self-contained book presents in a unified, systematic way the basic principles of optimal control governed by ODEs. Using a variational perspective, the author incorporates important restrictions like constraints for control and state, as well as the state system itself, into the equivalent variational reformulation of the problem. The fundamental issues of existence of optimal solutions, optimality conditions, and numerical approximation are then examined from this variational viewpoint. Inside, readers will find a unified approach to all the basic issues of optimal control, academic and real-world examples testing the book’s variational approach, and a rigorous treatment stressing ideas and arguments rather than the underlying mathematical formalism. A Variational Approach to Optimal Control of ODEs is mainly for applied analysts, applied mathematicians, and control engineers, but will also be helpful to other scientists and engineers who want to understand the basic principles of optimal control governed by ODEs. It requires no prerequisites in variational problems or expertise in numerical approximation. It can be used for a first course in optimal control.

Course and Curriculum Improvement Projects: Mathematics, Science, Social Sciences

Polyhedral and Algebraic Methods in Computational Geometry

Springer Science & Business Media Polyhedral and Algebraic Methods in Computational Geometry provides a thorough introduction into algorithmic geometry and its applications. It presents its primary topics from the viewpoints of discrete, convex and elementary algebraic geometry. The first part of the book studies classical problems and techniques that refer to polyhedral structures. The authors include a study on algorithms for computing convex hulls as well as the construction of Voronoi diagrams and Delone triangulations. The second part of the book develops the primary concepts of (non-linear) computational algebraic geometry. Here, the book looks at Gröbner bases and solving systems of polynomial equations. The theory is illustrated by applications in computer graphics, curve reconstruction and robotics. Throughout the book, interconnections between computational geometry and other disciplines (such as algebraic geometry, optimization and numerical mathematics) are established. Polyhedral and Algebraic Methods in Computational Geometry is directed towards advanced undergraduates in mathematics and computer science, as well as towards engineering students who are interested in the applications of computational geometry.

Introduction to Optimal Control Theory

Springer Science & Business Media This monograph is an introduction to optimal control theory for systems governed by vector ordinary differential equations. It is not intended as a state-of-the-art handbook for researchers. We have tried to keep two types of reader in mind: (1) mathematicians, graduate students, and advanced undergraduates in mathematics who want a concise introduction to a field which contains nontrivial interesting applications of mathematics (for example, weak convergence, convexity, and the theory of ordinary differential equations); (2) economists, applied scientists, and engineers who want to understand some of the mathematical foundations. of optimal control theory. In general, we have emphasized motivation and explanation, avoiding the "definition-axiom-theorem-proof" approach. We make use of a large number of examples, especially one simple canonical example which we carry through the entire book. In proving theorems, we often just prove the simplest case, then state the more general results which can be proved. Many of the more difficult topics are discussed in the "Notes" sections at the end of chapters and several major proofs are in the Appendices. We feel that a solid understanding of basic facts is best attained by at first avoiding excessive generality. We have not tried to give an exhaustive list of references, preferring to refer the reader to existing books or papers with extensive bibliographies. References are given by author's name and the year of publication, e.g., Waltman [1974].

Linear Algebra

Springer Science & Business Media This book covers the material of an introductory course in linear algebra. Topics include sets and maps, vector spaces, bases, linear maps, matrices, determinants, systems of linear equations, Euclidean spaces, eigenvalues and eigenvectors, diagonalization of self-adjoint operators, and classification of matrices. It contains multiple choice tests with commented answers.

Topological and Uniform Spaces

Springer Science & Business Media This book is based on lectures I have given to undergraduate and graduate audiences at Oxford and elsewhere over the years. My aim has been to provide an outline of both the topological theory and the uniform theory, with an emphasis on the relation between the two. Although I hope that the prospec tive specialist may find it useful as an introduction it is the non-specialist I have had more in mind in selecting the contents. Thus I have tended to avoid the ingenious examples and counterexamples which often occupy much ofthe space in books on general topology, and I have tried to keep the number of definitions down to the essential minimum. There are no particular pre requisites but I have worked on the assumption that a potential reader will already have had some experience of working with sets and functions and will also be familiar with the basic concepts of algebra and analysis. There are a number of fine books on general topology, some of which I have listed in the Select Bibliography at the end of this volume. Of course I have benefited greatly from this previous work in writing my own account. Undoubtedly the strongest influence is that of Bourbaki's Topologie Generale [2], the definitive treatment of the subject which first appeared over a genera tion ago.

Bodies of Constant Width

An Introduction to Convex Geometry with Applications

Springer This is the first comprehensive monograph to thoroughly investigate constant width bodies, which is a classic area of interest within convex geometry. It examines bodies of constant width from several points of view, and, in doing so, shows surprising connections between various areas of mathematics. Concise explanations and detailed proofs demonstrate the many interesting properties and applications of these bodies. Numerous instructive diagrams are provided throughout to illustrate these concepts. An introduction to convexity theory is first provided, and the basic properties of constant width bodies are then presented. The book then delves into a number of related topics, which include Constant width bodies in convexity (sections and projections, complete and reduced sets, mixed volumes, and further partial fields) Sets of constant width in non-Euclidean geometries (in real Banach spaces, and in hyperbolic, spherical, and further non-Euclidean spaces) The concept of constant width in analysis (using Fourier series, spherical integration, and other related methods) Sets of constant width in differential geometry (using systems of lines and discussing notions like curvature, evolutes, etc.) Bodies of constant width in topology (hyperspaces, transnormal manifolds, fiber bundles, and related topics) The notion of constant width in discrete geometry (referring to geometric inequalities, packings and coverings, etc.) Technical applications, such as film projectors, the square-hole drill, and rotary engines Bodies of Constant Width: An Introduction to Convex Geometry with Applications will be a valuable resource for graduate and advanced undergraduate students studying convex geometry and related fields. Additionally, it will appeal to any mathematicians with a general interest in geometry.

Revue Roumaine de Mathématiques Pures Et Appliquées

Artificial Intelligence and Symbolic Computation

International Conference AISC 2000 Madrid, Spain, July 17-19, 2000. Revised Papers

Springer This book constitutes the thoroughly refereed post-proceedings of the International Conference on Artificial Intelligence and Symbolic Computation, AISC 2000, held in Madrid, Spain in July 2000. The 17 revised full papers presented together with three invited papers were carefully reviewed and revised for inclusion in the book. Among the topics addressed are automated theorem proving, logical reasoning, mathematical modeling of multi-agent systems, expert systems and machine learning, computational mathematics, engineering, and industrial applications.

Notes on Set Theory

Springer Science & Business Media What this book is about. The theory of sets is a vibrant, exciting math ematical theory, with its own basic notions, fundamental results and deep open problems, and with significant applications to other mathematical theories. At the same time, axiomatic set theory is often viewed as a foun dation ofmathematics: it is alleged that all mathematical objects are sets, and their properties can be derived from the relatively few and elegant axioms about sets. Nothing so simple-minded can be quite true, but there is little doubt that in standard, current mathematical practice, "making a notion precise" is essentially synonymous with "defining it in set theory. " Set theory is the official language of mathematics, just as mathematics is the official language of science. Like most authors of elementary, introductory books about sets, I have tried to do justice to both aspects of the subject. From straight set theory, these Notes cover the basic facts about "ab stract sets," including the Axiom of Choice, transfinite recursion, and car dinal and ordinal numbers. Somewhat less common is the inclusion of a chapter on "pointsets" which focuses on results of interest to analysts and introduces the reader to the Continuum Problem, central to set theory from the very beginning.

Elementary Topology

Problem Textbook

American Mathematical Soc. This text contains a detailed introduction to general topology and an introduction to algebraic topology via its most classical and elementary segment. Proofs of theorems are separated from their formulations and are gathered at the end of each chapter, making this book appear like a problem book and also giving it appeal to the expert as a handbook. The book includes about 1,000 exercises.

Lectures on Convex Sets

World Scientific This book provides a systematic treatment of algebraic and topological properties of convex sets (possibly non-closed or unbounded) in the n-dimensional Euclidean space. Topics under consideration include general properties of convex sets and convex hulls, cones and conic hulls, polyhedral sets, the extreme structure, support and separation properties of convex sets. Lectures on Convex Sets is self-contained and unified in presentation. The book grew up out of various courses on geometry and convexity, taught by the author for more than a decade. It can be used as a textbook for graduate students and even ambitious undergraduates in mathematics, optimization, and operations research. It may also be viewed as a supplementary book for a course on convex geometry or convex analysis, or as a source for independent study of the subject, suitable for non-geometers. Contents:The Affine Structure of ℝnConvex SetsConvex HullsConvex Cones and Conic HullsRecession and Normal DirectionsSupport and Separation PropertiesThe Extreme Structure of Convex SetsThe Exposed Structure of Convex SetsPolyhedra Readership: Graduate students in mathematics, optimization and operations research. Key Features:The exposition is self-contained and detailed and provides multiple cross-references, which makes the book accessible to a very large audienceAn essential part of the text is adapted from various research articles, never presented before in a textbook formatThe book has a multidisciplinary character; it can be useful to specialists in geometry, convex analysis, operations research, and optimizationKeywords:Convex Set;Convex Hull;Cone;Support;Separation;Extreme;Exposed;Polyhedron

Convex Functions and Optimization Methods on Riemannian Manifolds

Springer Science & Business Media The object of this book is to present the basic facts of convex functions, standard dynamical systems, descent numerical algorithms and some computer programs on Riemannian manifolds in a form suitable for applied mathematicians, scientists and engineers. It contains mathematical information on these subjects and applications distributed in seven chapters whose topics are close to my own areas of research: Metric properties of Riemannian manifolds, First and second variations of the p-energy of a curve; Convex functions on Riemannian manifolds; Geometric examples of convex functions; Flows, convexity and energies; Semidefinite Hessians and applications; Minimization of functions on Riemannian manifolds. All the numerical algorithms, computer programs and the appendices (Riemannian convexity of functions f:R ~ R, Descent methods on the Poincare plane, Descent methods on the sphere, Completeness and convexity on Finsler manifolds) constitute an attempt to make accesible to all users of this book some basic computational techniques and implementation of geometric structures. To further aid the readers,this book also contains a part of the folklore about Riemannian geometry, convex functions and dynamical systems because it is unfortunately "nowhere" to be found in the same context; existing textbooks on convex functions on Euclidean spaces or on dynamical systems do not mention what happens in Riemannian geometry, while the papers dealing with Riemannian manifolds usually avoid discussing elementary facts. Usually a convex function on a Riemannian manifold is a real valued function whose restriction to every geodesic arc is convex.

Publicationes mathematicae

Linear Programming and Its Applications

Springer Science & Business Media Linear Programming and Its Applications is intended for a first course in linear programming, preferably in the sophomore or junior year of the typical undergraduate curriculum. The emphasis throughout the book is on linear programming skills via the algorithmic solution of small-scale problems, both in the general sense and in the specific applications where these problems naturally occur. The book arose from lecture notes prepared during the years 1985-1987 while I was a graduate assistant in the Department of Mathematics at The Pennsylvania State University. I used a preliminary draft in a Methods of Management Science class in the spring semester of 1988 at Lock Haven University. Having been extensively tried and tested in the classroom at various stages of its development, the book reflects many modifications either suggested directly by students or deemed appropriate from responses by students in the classroom setting. My primary aim in writing the book was to address common errors and difficulties as clearly and effectively as I could.

Introduction to Calculus and Classical Analysis

Springer This text is intended for an honors calculus course or for an introduction to analysis. Involving rigorous analysis, computational dexterity, and a breadth of applications, it is ideal for undergraduate majors. This third edition includes corrections as well as some additional material. Some features of the text include: The text is completely self-contained and starts with the real number axioms; The integral is defined as the area under the graph, while the area is defined for every subset of the plane; There is a heavy emphasis on computational problems, from the high-school quadratic formula to the formula for the derivative of the zeta function at zero; There are applications from many parts of analysis, e.g., convexity, the Cantor set, continued fractions, the AGM, the theta and zeta functions, transcendental numbers, the Bessel and gamma functions, and many more; Traditionally transcendentally presented material, such as infinite products, the Bernoulli series, and the zeta functional equation, is developed over the reals; and There are 385 problems with all the solutions at the back of the text.

Convex Sets and Their Applications

Courier Corporation Suitable for advanced undergraduates and graduate students, this text introduces the broad scope of convexity. It leads students to open questions and unsolved problems, and it highlights diverse applications. Author Steven R. Lay, Professor of Mathematics at Lee University in Tennessee, reinforces his teachings with numerous examples, plus exercises with hints and answers. The first three chapters form the foundation for all that follows, starting with a review of the fundamentals of linear algebra and topology. They also survey the development and applications of relationships between hyperplanes and convex sets. Subsequent chapters are relatively self-contained, each focusing on a particular aspect or application of convex sets. Topics include characterizations of convex sets, polytopes, duality, optimization, and convex functions. Hints, solutions, and references for the exercises appear at the back of the book.

Mathematics for Machine Learning

Cambridge University Press Distills key concepts from linear algebra, geometry, matrices, calculus, optimization, probability and statistics that are used in machine learning.

Convex Optimization

Cambridge University Press A comprehensive introduction to the tools, techniques and applications of convex optimization.

Linear and Convex Optimization

A Mathematical Approach

John Wiley & Sons Discover the practical impacts of current methods of optimization with this approachable, one-stop resource Linear and Convex Optimization: A Mathematical Approach delivers a concise and unified treatment of optimization with a focus on developing insights in problem structure, modeling, and algorithms. Convex optimization problems are covered in detail because of their many applications and the fast algorithms that have been developed to solve them. Experienced researcher and undergraduate teacher Mike Veatch presents the main algorithms used in linear, integer, and convex optimization in a mathematical style with an emphasis on what makes a class of problems practically solvable and developing insight into algorithms geometrically. Principles of algorithm design and the speed of algorithms are discussed in detail, requiring no background in algorithms. The book offers a breadth of recent applications to demonstrate the many areas in which optimization is successfully and frequently used, while the process of formulating optimization problems is addressed throughout. Linear and Convex Optimization contains a wide variety of features, including: Coverage of current methods in optimization in a style and level that remains appealing and accessible for mathematically trained undergraduates Enhanced insights into a few algorithms, instead of presenting many algorithms in cursory fashion An emphasis on the formulation of large, data-driven optimization problems Inclusion of linear, integer, and convex optimization, covering many practically solvable problems using algorithms that share many of the same concepts Presentation of a broad range of applications to fields like online marketing, disaster response, humanitarian development, public sector planning, health delivery, manufacturing, and supply chain management Ideal for upper level undergraduate mathematics majors with an interest in practical applications of mathematics, this book will also appeal to business, economics, computer science, and operations research majors with at least two years of mathematics training.

Noesis

A Source Book in Mathematics

Courier Corporation The writings of Newton, Leibniz, Pascal, Riemann, Bernoulli, and others in a comprehensive selection of 125 treatises dating from the Renaissance to the late 19th century — most unavailable elsewhere. Grouped in five sections: Number; Algebra; Geometry; Probability; and Calculus, Functions, and Quaternions. Includes a biographical-historical introduction for each article.

International Mathematical News

Scientific and Technical Books and Serials in Print

Optimal Control

An Introduction to the Theory with Applications

Oxford University Press This textbook is a straightforward introduction to the theory of optimal control with an emphasis on presenting many different applications. Professor Hocking has taken pains to ensure that the theory is developed to display the main themes of the arguments but without using sophisticated mathematical tools. Throughout there are many worked examples, and numerous exercises (with solutions) are provided.

Measure, Topology, and Fractal Geometry

Springer Science & Business Media From the reviews: "In the world of mathematics, the 1980's might well be described as the "decade of the fractal". Starting with Benoit Mandelbrot's remarkable text The Fractal Geometry of Nature, there has been a deluge of books, articles and television programmes about the beautiful mathematical objects, drawn by computers using recursive or iterative algorithms, which Mandelbrot christened fractals. Gerald Edgar's book is a significant addition to this deluge. Based on a course given to talented high- school students at Ohio University in 1988, it is, in fact, an advanced undergraduate textbook about the mathematics of fractal geometry, treating such topics as metric spaces, measure theory, dimension theory, and even some algebraic topology. However, the book also contains many good illustrations of fractals (including 16 color plates), together with Logo programs which were used to generate them. ... Here then, at last, is an answer to the question on the lips of so many: 'What exactly is a fractal?' I do not expect many of this book's readers to achieve a mature understanding of this answer to the question, but anyone interested in finding out about the mathematics of fractal geometry could not choose a better place to start looking." #Mathematics Teaching#1

Constructive Combinatorics

Springer Science & Business Media The notes that eventually became this book were written between 1977 and 1985 for the course called Constructive Combinatorics at the University of Minnesota. This is a one-quarter (10 week) course for upper level undergraduate students. The class usually consists of mathematics and computer science majors, with an occasional engineering student. Several graduate students in computer science also attend. At Minnesota, Constructive Combinatorics is the third quarter of a three quarter sequence. The fIrst quarter, Enumerative Combinatorics, is at the level of the texts by Bogart [Bo], Brualdi [Br], Liu [Li] or Tucker [Tu] and is a prerequisite for this course. The second quarter, Graph Theory and Optimization, is not a prerequisite. We assume that the students are familiar with the techniques of enumeration: basic counting principles, generating functions and inclusion/exclusion. This course evolved from a course on combinatorial algorithms. That course contained a mixture of graph algorithms, optimization and listing algorithms. The computer assignments generally consisted of testing algorithms on examples. While we felt that such material was useful and not without mathematical content, we did not think that the course had a coherent mathematical focus. Furthermore, much of it was being taught, or could have been taught, elsewhere. Graph algorithms and optimization, for instance, were inserted into the graph theory course where they naturally belonged. The computer science department already taught some of the material: the simpler algorithms in a discrete mathematics course; effIciency of algorithms in a more advanced course.

Mathematical Reviews

Books in Print