Telegraphic Reviews

Arnold Ostebee

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TELEGRAPHIC REVIEWS

Edited by **Arnold Ostebee**
with the assistance of the Mathematics Departments of
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Telegraphic Reviews are designed to alert readers in a timely manner to new books appropriate to mathematics teaching and research. Special codes classify reviews by subject area and appropriate use:

T : Textbook	P : Professional Reading	1–4: Semester
C : Computer Software	L : Undergraduate Library	** : Special Emphasis
S : Supplementary Reading	13: Grade Level	?? : Questionable

Readers are advised that price information is subject to change. Selected books receive a second, more extensive review in the *Monthly*.

Books submitted for review should be sent to *Book Reviews Editor, American Mathematical Monthly, St. Olaf College, 1520 St. Olaf Avenue, Northfield, MN 55057-1098.*

Mathematics Appreciation, T(13: 1, 2). *Mathematics: A Practical Odyssey, Third Edition.* David B. Johnson, Thomas A. Mowry. Brooks/Cole, 1998, xx + 835 pp, $66.95. [ISBN 0-534-35075-5] Revisions include new section on right angle trigonometry, appendix on dimensional analysis, optional subsections utilizing graphing calculator capabilities. (*Second Edition*, TR, November 1995.) KES

Education, P*, L. *Confronting the Core Curriculum: Considering Change in the Undergraduate Mathematics Major.* Ed: John A. Dossey. MAA Note Series No. 45. MAA, 1998, xii + 136 pp, $38.50 (P). [ISBN 0-88385-155-5] Proceedings of the 1994 "West Point Core Curriculum in Mathematics" conference and a 1995 follow-up workshop. Papers discuss course content issues and student growth goals for the first two years of the undergraduate mathematics curriculum. AO

Discrete Mathematics, T(13–14: 1, 2), L. *Discrete Algorithmic Mathematics, Second Edition.* Stephen B. Maurer, Anthony Ralston. AK Peters, 1998, xix + 894 pp, $59. [ISBN 1-56881-091-1] Republication of 1991 edition with corrections and a few small changes. Greater emphasis on algorithmics, and more sophisticated, than most discrete texts. (*First Edition*, TR, June–July 1991.) KES

Number Theory, P. *Finite Fields: Theory, Applications, and Algorithms.* Eds: Ronald C. Mullin, Gary L. Mullen. Contemp. Math., V. 225. AMS, 1999, x + 243 pp, $49 (P). [ISBN 0-8218-0817-6] Proceedings of a 1997 conference at the University of Waterloo.

Group Theory, P. *The Structure of Compact Groups: A Primer for the Student—A Handbook for the Expert.* Karl H. Hofmann, Sidney A. Morris. Stud. in Math., V. 25. Walter de Gruyter, 1998, xvii + 835 pp, $148.95. [ISBN 3-11-015268-1] A massive, self-contained resource for experts that avoids representation theory and harmonic analysis. JD

Group Theory, P. *Algebraic Groups and their Representations.* Eds: R.W. Carter, J. Saxl. NATO ASI Ser. C, V. 517. Kluwer Academic, 1998, xviii + 374 pp, $173. [ISBN 0-7923-5251-3] 19 articles written by speakers at the 1997 NATO Advanced Study Institute "Modular Representations and Subgroup Structure of Algebraic Groups and Related Finite Groups" held at the Isaac Newton Institute, Cambridge.

Ring Theory, P. *Semidistributive Modules and Rings.* Askar A. Tuganbaev. Math. & Its Applic., V. 449. Kluwer Academic, 1998, x + 352 pp, $157. [ISBN 0-7923-5209-2] Explores the relationship between semidistributive modules and flat, projective, injective, multiplication, and Bezout modules. JD

Ring Theory, T(18), P, L. *Lectures on Modules and Rings.* T.Y. Lam. Grad. Texts in Math., V. 189. Springer-Verlag, 1999, xxiii + 557 pp, $59.95. [ISBN 0-387-98428-3] A follow-up to Lam's *A First Course in Noncommutative Rings* (TR, February 1992); focuses on ring theory in which modules play a central role. Topics: free, projective, injective, and flat modules, rings of quotients, Frobenius rings, Morita theory. Includes 600 exercises. JD

Algebra, T(16–18: 1, 2), L. *Abstract Algebra,*

Second Edition. David S. Dummit, Richard M. Foote. Prentice Hall, 1999, xiv + 898 pp. [ISBN 0-13-569302-0] New material on quadratic integer rings, tensor products of modules and tensor algebras, homological algebra, group cohomology; new chapters on commutative rings and algebraic geometry. (*First Edition*, TR, January 1993.) KES

Algebra, T(18), P, L. *Representations and Cohomology, I: Basic Representation Theory of Finite Groups and Associative Algebras.* D.J. Benson. Stud. in Adv. Math., V. 30. Cambridge Univ Pr, 1995, xi + 246 pp, $29.95 (P); $52.95. [ISBN 0-521-63653-1; 0-521-36134-6] Provides modular representation theoretic background for the study of group cohomology in *Volume II. Volume I* concentrates on Auslander–Reiten type representation theory, Burnside rings, and block theory with a cohomological flavor. JD

Algebra, P. *The Monster and Lie Algebras.* Eds: J. Ferrar, K. Harada. Ohio St. Univ. Math. Res. Inst. Public., V. 7. Walter de Gruyter, 1998, x + 252 pp, $248. [ISBN 3-11-016184-2] Proceedings of a 1996 special research quarter at the Ohio State University. In two parts: 9 papers on the Monster; 7 papers on Lie Algebras.

Calculus, S(13), L. *How to Ace Calculus: The Streetwise Guide.* Colin Adams, Joel Hass, Abigail Thompson. WH Freeman, 1998, x + 242 pp, $14.95 (P). [ISBN 0-7167-3160-6] Highly entertaining, useful. Gives advice on such matters as "How to deal with your instructor" (e.g., ask: "Where did you get those ultra cool shoes?") together with a serious, very traditional treatment of calculus topics (e.g., gives much more space to techniques of integration than to numerical techniques; computers are barely mentioned). Certain "light" sections (e.g., "Choosing your instructor") may put some people off. KS

Calculus, T*(13: 3). *Calculus: Single and Multivariable, Second Edition.* Deborah Hughes-Hallett, *et al.* Wiley, 1998, xix + 984 pp, $111.95, [ISBN 0-471-19490-5]; *Calculus: Single Variable, Second Edition.* Wiley, 1998, xvii + 647 pp, $79.95 (P). [ISBN 0-471-16442-9] From the Preface: "We have streamlined some topics and added new sections on theory and on skill-building; we have moved some material into separate sections on modeling." (*First Edition*, TR, February 1994.)

Real Analysis, T(17: 3, 4), P, L. *Fundamentals of Real Analysis.* Sterling K. Berberian. Universitext. Springer-Verlag, 1999, xi + 479 pp, $44.95 (P). [ISBN 0-387-98480-1] Lecture notes from year-long course given at the University of Texas (1985–86). Includes introductory chapters on foundations and basic topology, then detailed treatment of Lebesgue and abstract measure theory leading to function spaces. Includes other topics. Plenty of exercises. KS

Complex Analysis, T(18: 1), P. *Computational Conformal Mapping.* Prem K. Kythe. Birkhäuser Boston, 1998, xv + 462 pp, $69.95. [ISBN 0-8176-3996-9] The theory and computation of conformal mappings of simply or multiply connected regions onto the unit disk and other canonical regions. Applies theory to mathematics, physics, and engineering. PG

Complex Analysis, P. *Complex Geometric Analysis in Pohang.* Eds: Kang-Tae Kim, Steven G. Krantz. Contemp. Math., V. 222. AMS, 1999, vii + 256 pp, $55 (P). [ISBN 0-8218-0957-1] Proceedings of a 1997 conference on several complex variables at Pohang University (South Korea).

Dynamical Systems, P. *Nonlocal Bifurcations.* Yu. Ilyashenko, Weigu Ki. Math. Surv. & Mono., V. 66. AMS, 1999, xiii + 286 pp, $69. [ISBN 0-8218-0497-9] Modern theory of normal forms for local families of vector fields and diffeomorphisms, hyperbolic theory, study of bifurcations on boundaries of Morse–Smale systems. RM

Numerical Analysis, S(17), P. *Numerical Linear Algebra for High-Performance Computers.* Jack J. Dongarra, *et al.* SIAM, 1998, xviii + 342 pp, $37 (P). [ISBN 0-89871-428-1] Surveys the state of the art of solving systems of linear equations and large-scale eigenvalue problems on high-performance (i.e., vector and parallel) computers. A major revision of *Solving Linear Systems on Vector and Shared Memory Computers* (TR, May 1991). AO

Functional Analysis, P. *Banach Algebras '97.* Eds: Ernst Albrecht, Martin Mathieu. Walter de Gruyter, 1998, x + 566 pp, $148.95. [ISBN 3-11-015466-8] Proceedings of a conference held at the University of Tübingen. Research articles, survey articles on problems in automatic continuity and problems related to notions of amenability, and a list of open questions.

Analysis, P, L. *A Primer of Infinitesimal Analysis.* John L. Bell. Cambridge Univ Pr, 1998, xiii + 122 pp, $29.95. [ISBN 0-521-62401-0] Develops basic calculus (single and multivariable) and some physical applications in the context of smooth infinitesimal analysis; includes a chapter on synthetic differential geometry. Theory based on nilpotent infinitesimals (from category theory) rather than nonstandard analysis. AO

Analysis, P. *Wavelets and Their Applications:*

Case Studies. Ed: Mei Kobayashi. SIAM, 1998, xvi + 142 pp, $32 (P). [ISBN 0-89871-416-8] 5 independent essays describe the use of wavelet techniques in mechanical and nuclear engineering, seismology, signal processing, and partial differential equations.

Algebraic Geometry, P. *Higher Homotopy Structures in Topology and Mathematical Physics.* Ed: John McCleary. Contemp. Math., V. 227. AMS, 1999, xii + 321 pp, $69 (P). [ISBN 0-8218-0913-X] Proceedings of a 1996 conference at Vassar College held to honor the 60th birthday of Jim Stasheff.

Geometry, P. *Advances in Discrete and Computational Geometry.* Eds: Bernard Chazelle, Jacob E. Goodman, Richard Pollack. Contemp. Math., V. 223. AMS, 1999, xi + 463 pp, $99 (P). [ISBN 0-8218-0674-2] Proceedings of the 1996 AMS–IMS–SIAM Joint Summer Research Conference "Discrete and Computational Geometry: Ten Years Later" held at Mount Holyoke College.

Algebraic Topology, T(18), P. *Model Categories.* Mark Hovey. Math. Surv. & Mono., V. 63. AMS, 1999, xii + 209 pp, $54. [ISBN 0-8218-1359-5] Much needed comprehensive resource on the relationship between a model category and its homotopy category. Accessible to graduate students with some background in homological algebra. JD

Optimization, T(16–17: 1), P. *Maxima and Minima with Applications: Practical Optimization and Duality.* Wilfred Kaplan. Ser. in Disc. Math. & Optim. Wiley, 1999, x + 284 pp, $74.95. [ISBN 0-471-25289-1] 4 chapters: basic concepts and geometric aspects; problems with side conditions; optimization and mathematical programming; Frenchel–Rockafellar duality theory. Prerequisites: (advanced) calculus and linear algebra. AO

Optimization, T(16–17: 1), P, L. *Integer Programming.* Laurence A. Wolsey. Ser. in Disc. Math. & Optimiz. Wiley, 1998, xviii + 264 pp, $59.95. [ISBN 0-471-28366-5] Incorporates recent developments (e.g., cutting plane theory, heuristic methods). Assumes some knowledge of linear programming and graph theory, but otherwise self-contained. AO

Optimal Control, P. *Geometric Control and Non-Holonomic Mechanics.* V. Jurdjevic, R.W. Sharpe. Conf. Proc., V. 25. AMS, 1998, xi + 239 pp, $49 (P). [ISBN 0-8218-0795-1] Proceedings of a 1996 conference in Mexico City.

Optimal Control, P. *Mathematical Control Theory.* Eds: J. Baillieul, J.C. Willems. Springer-Verlag, 1999, xxxii + 360 pp, $59.95.

[ISBN 0-387-98317-1] 9 papers on the development of control theory over the last 30 years. Focus is on areas influenced by R.W. Brockett.

Probability, S, P, L. *The Design Inference: Eliminating Chance Through Small Probabilities.* William A. Dembski. Stud. in Prob., Induction, & Decision Theory. Cambridge Univ Pr, 1998, xvii + 243 pp, $54.95. [ISBN 0-521-62387-1] Not a text but a philosophical tract about when one can infer design behind events of very small probability. Thought provoking, fun to read, full of interesting examples. SN

Stochastic Processes, P. *Ergodicity and Stability of Stochastic Processes.* A.A. Borovkov. Transl: V. Yurinsky. Ser. in Prob. & Stat. Wiley, 1998, xxiii + 585 pp, $175. [ISBN 0-471-97913-9] In-depth treatment of the asymptotic behavior and resulting invariant distributions of Markov chains and some of their generalizations. Includes applications to queueing and communication networks. SN

Elementary Statistics, S(14: 1), L. *Basic Business Statistics: A Casebook.* Dean P. Foster, Robert A. Stine, Richard P. Waterman. Springer-Verlag, 1998, xvi + 244 pp, $34.95 (P). [ISBN 0-387-98354-6] 11 classes of related case studies that each develop a single, key statistical idea and show how to use statistics to answer business questions. Book meant to replace lectures. Topics: summary statistics, sources of variation, standard error, confidence intervals, sampling, hypothesis testing, design of experiments, introduction to regression. Uses JMP but also provides Minitab commands. Includes three assignments. Data available via the web. KB

Elementary Statistics, S(14: 1), L. *Business Analysis Using Regression: A Casebook.* Dean P. Foster, Robert A. Stine, Richard P. Waterman. Springer-Verlag, 1998, xvii + 348 pp, $39.95 (P). [ISBN 0-387-98356-2] Companion volume to *Basic Business Statistics*; same general structure but with 12 classes of cases. Topics: fitting equations to data regression assumptions, prediction and confidence intervals, multiple regression, modeling categorical factors, one- and two-way ANOVA, modeling categorical response, time series. (1997 edition, TR, March 1998.) KB

Elementary Statistics, T(13: 2), C. *Statistical Methods for Engineers.* G. Geoffrey Vining. Duxbury Pr (Wadsworth), 1998, xv + 479 pp, $72.95, with disk. [ISBN 0-534-23706-1] Lays solid foundation for application of statistics within an engineering context; presents students with statistical tools used by practicing engineers. Implements ABET's cur-

riculum recommendations for teaching engineering statistics. Uses real engineering cases and data. Extensive graphical analysis throughout. Encourages computer use. KB

Statistical Methods, P. *Computer Assisted Survey Information Collection.* Eds: Mick P. Couper, *et al.* Ser. in Prob. & Stat. Surv. Methodology Sec. Wiley, 1998, xvi + 653 pp, $89.95. [ISBN 0-471-17848-9] An authoritative and comprehensive review of the field. 29 papers in 8 sections: Introduction and Historical Overview; Transition to CASIC; Instrument Design; Issues in Survey Design; Case Management; Interviewers as Users of CASIC; Self-Administered Surveys; Emerging Technologies in CASIC.

Statistical Methods, P. *A Practical Guide to Heavy Tails: Statistical Techniques and Applications.* Eds: Robert J. Adler, Raisa E. Feldman, Murad S. Taqqu. Birkhäuser Boston, 1998, xvi + 533 pp, $59.95. [ISBN 0-8176-3951-9] 24 expository papers on applications, data analytic techniques, and models for heavy-tailed distributions and processes. Aimed at general practitioners. 7 sections: Applications; Time Series; Heavy-Tail Estimation; Regression; Signal Processing; Model Structures; Numerical Procedures.

Statistical Methods, T(15–17: 2), C, P, L. *Methods for Business Analysis and Forecasting: Text and Cases.* Peter Tryfos. Wiley, 1998, xiv + 576 pp, $84.95, with disk. [ISBN 0-471-12384-6] Covers the principal methods for analysis and forecasting including linear models, regression, and econometrics. Deals with models for relationships involving quantitative or qualitative dependent and explanatory variables. Examples, problems, and cases use real data. Emphasizes model formulation and interpretation rather than computation. Includes 16 extensive cases. KB

Applications (Communication Theory), T(15–17: 1), P, L. *Fourier Analysis and Applications: Filtering, Numerical Computation, Wavelets.* C. Gasquet, P. Witomski. Transl: R. Ryan. Texts in Appl. Math., V. 30. Springer-Verlag, 1999, xviii + 442 pp, $49.95. [ISBN 0-387-98485-2] Begins with material on signal processing and filters. Discusses convergence of Fourier series. Introduces Lebesgue theory, Hilbert space, and distribution theory; applies these theories to filters and sampling. Modular presentation. PG

Applications (Communication Theory), T(16: 1, 2), S, P, L. *Wavelet Analysis: The Scalable Structure of Information.* Howard L. Resnikoff, Raymond O. Wells, Jr. Springer-Verlag, 1998, xvi + 435 pp, $59.95. [ISBN 0-387-98383-X] Introductory monograph on wavelets and their applications to signal-processing. In four main parts: basics on information theory; wavelet theory; wavelet approximation and methods; applications. Clear and readable, with many illustrations, figures, and examples. No exercises. PZ

Applications (Economics), T??(15–16), S**, L. *A Guide to Econometrics, Fourth Edition.* Peter Kennedy. MIT Pr, 1998, xiii + 468 pp, $18.95 (P). [ISBN 0-262-61140-6] Econometric problems arise from situations where usual basic assumptions underlying linear regression model are violated. Econometrics texts are "catalogs" of which estimators are desirable in what situations. Shows how to "read the catalog" and deal with the problems. (*Third Edition*, TR, March 1993.) RM

Applications (Engineering), T*(14–15: 2). *Analytical and Computational Methods of Advanced Engineering Mathematics.* Grant B. Gustafson, Calvin H. Wilcox. Texts in Appl. Math., V. 28. Springer-Verlag, 1998, xxii + 729 pp, $59.95. [ISBN 0-387-98265-5] Covers standard body of material (ODEs, vector calculus, linear algebra, PDEs) using modern perspectives. Emphasizes numerical techniques from the beginning, acknowledges the availability of computer algebra systems. Uses real-world problems extensively. AO

Applications, T(14: 1). *All You Wanted To Know About Mathematics But Were Afraid To Ask: Mathematics for Science Students, Volume 2.* Louis Lyons. Cambridge Univ Pr, 1998, xv + 382 pp, $27.95 (P); $69.95. [ISBN 0-521-43601-X; 0-521-43466-1] Entertaining and accessible exposition. Topics include multivariable and vector calculus, PDEs, Fourier series, normal modes, waves, and linear algebra. AO

Applications, P. *Lecture Notes in Control and Information Sciences–237: The Confluence of Vision and Control.* Eds: David J. Kriegman, Gregory D. Hager, A. Stephen Morse. Springer-Verlag, 1998, xii + 281 pp, $85 (P). [ISBN 1-85233-025-2] Proceedings of a 1997 workshop held on Block Island, Rhode Island. Papers discuss theoretical results, empirical investigations, and applications.

Reviewers