Book Announcements

THIS issue contains our first Book Announcements section. The purpose of this section is to help make you aware of current books in those technical areas within the scope of this Journal. In addition to listing such information as author's name and affiliation, title, publisher, date, number of pages, and when available, price, each announcement gives the purpose and contents of the book. The purpose is extracted from the preface of the book, and the contents are a listing of the chapter titles. We plan to publish periodically the titles of books in selected technical areas; for example, all of the books written since 1980 on the subject of linear system theory. We would welcome both suggestions and material for this section. Please feel free to communicate directly with the Book Announcements Editor, Professor David G. Hull, at the University of Texas at Austin.

Donald C. Fraser
Editor-in-Chief

KUO, B.C., University of Illinois, ***Digital Control Systems.*** Holt, Rinehart and Winston, New York, 1980, 730 pages. $39.95.

Purpose: This book is intended as a text for a one-semester university course, as a reference for practicing engineers, and as a text for self-study purposes. It is a revised version of an earlier book of the same name. Conventional analysis and design methods have been expanded; more design examples, microprocessor control, and more problems have been included. Knowledge of feedback control theory, matrix algebra, and Laplace transforms is essential.

Contents: Introduction. Signal conversion and processing. The Z-transform. The state variable technique. Stability of digital control systems. Digital simulation and digital redesign. Time-domain analysis. Frequency-domain analysis. Controllability and observability. Design of digital control systems. Design by maximum principle. Optimal linear digital regulator design. Digital state observer. Microprocessor control. Appendix. Index.

FRANKLIN, G.F. and POWELL, J.D., Stanford University, ***Digital Control of Dynamic Systems.*** Addison-Wesley, Reading, Mass., 1980, 335 pages. $32.95.

Purpose: This book has been designed for a two-semester course on the use of the digital computer in the real-time control of dynamic systems. The emphasis is on the design of digital controls to achieve good dynamic response and small errors while using signals that are sampled in time and quantized in amplitude. It is assumed that the reader has a first course in linear feedback controls.

Contents: Introduction. Linear discrete dynamic systems analysis: the Z-transform. Discrete equivalents to continuous transfer functions: the digital filter. Sampled data systems. Design of digital control systems using state-space methods. Quantization effects. System identification. Multivariable and optimal control. Sample rate selection. Appendices. References. Index.

ISERMANN, R., Technische Hochschule Darmstadt, ***Digital Control Systems.*** Springer-Verlag, New York, 1981, 566 pages. $44.50.

Purpose: This book is directed toward engineers in industry and research and to students of engineering who are familiar with the basic design techniques for linear control systems and who want an introduction to the basic theory and application of digital control systems.

Contents: Introduction. Control with digital computers. Discrete-time systems. Deterministic control systems. Parameter-optimized controllers. Cancellation controllers. Controllers for finite settling time (deadbeat). State controllers. Controllers for processes with large dead-time. Control of variable processes with constant controllers. Comparison of different controllers for deterministic disturbances. Stochastic control systems. Parameter-optimized controllers for stochastic disturbances. Minimum variance controllers for stochastic disturbances. State controllers for stochastic disturbances. Cascade control systems. Feedforward control. Structures of multivariable processes. Parameter-optimized multivariable control systems. Multivariable matrix polynomial control systems. Multivariable state control systems. Adaptive control systems—a short review. On-line identification of dynamical processes and stochastic signals. Identification in closed loop. Parameter-adaptive controllers. The influence of amplitude quantization on digital control. Filtering of disturbances. Combining control algorithms and actuators. Computer aided control algorithm design. Case studies of identification and digital control. Appendix. Literature. Index.

GRADSHTEYN, I.S. and RYZHIK, I.M., ***Table of Integrals, Series, and Products,*** corrected and enlarged edition prepared by A. Jeffrey. Academic Press, San Diego, 1980, 1160 pages. $24.95.

Purpose: This book is a comprehensive table of integrals which was originally published in 1963 and has undergone several revisions.

Contents: Introduction. Elementary functions. Indefinite integrals of elementary functions. Definite integrals of elementary functions. Indefinite integrals of special functions. Definite integrals of special functions. Vector field theory. Algebraic inequalities. Integral inequalities. Matrices and related results. Determinants. Norms. Ordinary differential equations. Fourier and Laplace transforms. Bibliographic references.

HALE, F.J., North Carolina State University, ***Introduction to Aircraft Performance, Selection, and Design.*** John Wiley and Sons, New York, 1984, 290 pages. $37.45.

Purpose: This book has been written for an introductory course in aerospace engineering and hence requires no previous knowledge of aerodynamics, propulsion, or structures for its use. Since the emphasis throughout the book is on the determination of the key parameters and a physical appreciation of their influence on the performance and design of an aircraft, analytical expressions and closed-form solutions are stressed.

Contents: Introduction. Aircraft forces and subsystems. Level flight in the vertical plane: turbojets. Other flight in the vertical plane: turbojets. Turning flight in the horizontal plane: turbojets. Level flight in a vertical plane: piston-props. Other flight: piston-props. Turboprops, turbofans, and other concepts. Figures of merit for selection and design. Effects of wind on performance. Stability and control considerations. Some design examples. Selected references. Appendices. Index.