

# Book Announcements

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**CALLIER, F. M. and DESOER, C. A.,** *Linear Systems Theory*, Springer-Verlag, New York, 1991, 509 pages, \$59.50.

**Purpose:** This book primarily treats finite dimensional linear systems. It is a useful reference for first-year graduate students.

**Contents:** Continuous and discrete-time system representations; general system concepts; sampled data systems; stability; controllability and observability; realization theory; linear state feedback and estimation; unity feedback systems.

**SKOWRONSKI, J. M.,** *Control of Nonlinear Mechanical Systems*, Plenum Press, New York, 1991, 445 pages.

**Purpose:** This book deals with the control of nonlinear and uncertain systems, primarily, robotic systems.

**Contents:** Mechanical systems; state, energy, and power; stabilization; global pattern of steady states; collision and capture; avoidance; adaptive tracking control; dynamic games.

**SKOWRONSKI, J. M.,** *Nonlinear Liapunov Dynamics*, World Scientific Co., Singapore, 1991, 597 pages.

**Purpose:** This book presents the Liapunov formalism for the analysis and design of a large class of physical nonlinear systems.

**Contents:** Structures in system dynamics; lumped model; symplectic physical model; energy flows; review of the Liapunov formalism; autonomous systems; nonautonomous systems; kinetic synthesis.

**SEN, A. K.,** *Dynamics of Gyroscopic Bodies*, Synchronat Press, Ottawa, Canada, 1987, 106 pages.

**Purpose:** This monograph deals with the dynamics of dual-spin spacecraft.

**Contents:** Kinematics; equations of motion using the vectorial and Lagrange's approach; concluding remarks and discussion of the literature.

**MESAROVIC, M. D. and TAKAHARA, Y.,** *Abstract Systems Theory*, Lecture Notes in Control and Information Sciences, Vol. 116, Springer-Verlag, Berlin, 1989, 439 pages.

**Purpose:** This book presents new results on Abstract System Theory based on the "top-down"-formalization-approach.

**Contents:** Basic systems concepts via formalization; basic attributes; structured terminal systems characterization; basic properties of abstract time systems; goal-seeking system; complex systems.

**WELLSTEAD, P. E. and ZARROP, M. B.,** *Self-Tuning Systems: Control and Signal Processing*, Wiley, Chichester, England, UK, 1991, 579 pages, \$64.95.

**Purpose:** This book presents self-tuning control and signal processing from a user's point of view.

**Contents:** System and signal models; recursive estimation, computational alternatives, and convergence analysis; pole assignment control; minimum variance control; multistage predictive control; prediction and self-tuning filters; two-dimensional self-tuning algorithms; self-tuning extremum control; frequency domain self-tuning.

**WERTZ, J. R. and WILEY, J. L., (eds.),** *Space Mission Analysis and Design*, Kluwer Academic Publishers, Boston, 1991, 809 pages, \$34.50.

**Purpose:** This book deals with design of space missions to meet a set of broad, often poorly defined, objectives.

**Contents:** Mission analysis and design procedure; characterization and evaluation of missions; requirements definition; geometry; astrodynamics; orbit and constellation design; space environment and survivability; defining and sizing payloads; spacecraft design and sizing; spacecraft subsystems; manufacture and test; communications architecture; mission operations; ground system design and sizing; spacecraft propulsion, launch and computer systems; space logistics and reliability; cost modeling; limits on mission design; design of low-cost spacecraft; international spacecraft design experience.