

Feedback Control Bakshi

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<i>Feedback Control Bakshi</i>	<i>2022-09-18</i>
HOWARD SHANIYA	
<i>Electron Devices and Circuits</i> Technical Publications	
The importance of measuring instruments is well known in the various engineering fields. The book provides comprehensive coverage of various electrical, electronic and digital instruments, instrument transformers, measurement of power and energy, d.c. and a.c. bridges and oscilloscopes. The book starts with explaining the classification and requirements of a measuring instrument. Then the book explains the PMMC, moving iron and electro-dynamometer type instruments. Extension of range of instruments using shunts and multipliers is also included in the book. The book includes detailed discussion of instrument transformers and power factor meters. The book covers the types of wattmeters, errors and compensations. The chapter on energy measurement includes discussion of single and three phase energy meters, errors and compensations. The book teaches the details of d.c and a.c. potentiometers along with their applications. The book further explains various d.c. and a.c. bridges along with necessary derivations and phasor diagrams. It also includes the discussion of various magnetic measurements. The book incorporates the discussion of oscilloscopes. It also explains the various oscilloscope measurements and Lissajous figures. Finally, the book includes the discussion of various digital meters such as digital voltmeters, digital multimeter, digital frequency meter and digital tachometer along with the automation in digital instruments. Each chapter starts gives the conceptual knowledge about the topic dividing it in various sections and subsections. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.	
<i>Electrical Instrumentation & Process Control</i> Springer	
Open loop and closed loop systems, Servomechanism, Basic structure of a feedback control system. Dynamic Models and Responses Dynamic model of an RLC network, State variable model, Impulse response model, Transfer function model, Standard test/disturbance signals and their models, Transfer function model and dynamic response of a second order electrical system. Control System Components Basic units of feedback control system, Reduction of system block diagrams, Signal flow graph, Mason's gain rule, Block diagram reduction using Mason's gain rule, Operational amplifier used as an error detector, Servo potentiometer, DC and AC servomotors, Tachogenerator, Stepper motor, Synchros, Block diagram model of a typical control system using simplified sub-system, Transfer function blocks. Feedback Control System Characteristics Stability, Sensitivity, Disturbance rejection, Steady state accuracy, Transient and steady state responses of a second order system, Effect of additional zeros and poles, Desired closed loop pole locations and dominant poles, Steady state error constants, System type numbers and error compensation. System Stability Analysis and Compensator Design System stability bounds, Routh stability criterion, Relative stability and range of stability, Root locus concept, System characteristic equation, Plotting root loci, Design of cascade lag-lead compensation, Minor loop (rate) feedback compensation. Nyquist Criterion and Stability Margins Nyquist stability criterions, Nyquist diagrams, Gain and phase margins, Bode plot of magnitude and phase and determination of stability margins. Feedback System Performance Performance specifications in frequency domain, Correlation between frequency domain and time domain specifications, Constant - M circles, Nichols chart, Stability margins from sensitivity function. Design of cascade lag-lead compensation using Bode plot. Minor loop (rate) feedback compensation.	
Network Analysis Technical Publications	
The book covers all the aspects of Transmission and Distribution for undergraduate course. The various aspects of transmission and distribution systems, FACTS, sag calculations, parameters and performance of transmission lines, insulators, cables, substations and grounding systems are	

explained in the book with the help of comprehensive approach. The book starts with the discussion of basics of power system. It includes comparison of material required for overhead and underground systems. Various types of d.c. and a.c. distribution systems, EHVAC, HVDC and FACTS devices is also included in the book. The book explains the sag calculation under different conditions and sag template. In depth analysis of transmission line parameters is also included in the book. The book also covers the performance analysis of short, medium and long transmission lines along with circle diagram and methods of voltage control. The details of corona effect are explained in support. The book incorporates the discussion of types of insulators, string efficiency, methods of improving string efficiency, single and three core cables, grading of cables, heating and testing of cables. The chapter on substations includes the explanation of various types of substations, substation equipment's and key diagrams. The book also covers the various types of grounding systems, grounding grids and resistance of grounding systems. The book uses plain and lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. Each chapter is well supported with necessary illustrations, self-explanatory diagrams and large number of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Circuits and Networks Technical Publications

Linear control systems, Definitions & elements of control system, Open loop and closed loop control system, Feedback & feedforward control system, Linear & nonlinear control system. Transfer function by block diagram reduction technique & by signal flow graph analysis using Mason's gain formula. Time domain analysis control system, Steady state performance specifications. Time domain analysis : Transient response of first & second order system, For various test signals, Steady state performance specifications. Stability of control system, Determination of stability of control system, Routh Hurwitz criteria, Root locus technique. Frequency response of control system, Co-relation between time domain & frequency domain specifications, Bode plots, Calculation of phase margin and gain margin, Performance of lead and lag network in frequency domain analysis. Mapping theorem, Determination of stability using Nyquist's criterion. State variable representation of control system (SISO, MIMO), Conversion of state variable into transfer function & vice-versa, Solution of state equ., State transition matrix. Control system components, Error detectors, Potentiometers, Synchros, Actuators, Servomotors, Tacho generators, AC & DC servomotors, Stepper motors, Transfer function of AC, DC servosystems.

Control System Engineering Technical Publications

The book covers all the aspects of theory, analysis, and design of Electronic Circuits for the undergraduate course. The concepts of feedback amplifiers and oscillators, tuned amplifiers, wave shaping and multivibrator circuits, power amplifiers, and DC converters are explained in a comprehensive manner. The former part of the book focuses on the fundamental concepts of feedback amplifiers and oscillators. It explains the analysis of series-shunt, series-series, shunt-shunt, and shunt-series feedback amplifiers, stability and frequency compensation in feedback amplifiers. The concepts of the Barkhausen criterion for oscillations and the detailed analysis of various oscillator circuits including phase shift, Wien bridge, Hartley, Colpitt's, Clapp, ring, and crystal oscillators are included in the book. The oscillator amplitude stabilization is explained in support. Then the book focuses on the fundamental concept of tuned amplifiers. It explains topics such as coil losses, unloaded and loaded Q of tank circuits, analysis of single and double tuned amplifiers, the effect of cascading single tuned and double tuned amplifiers on bandwidth, stagger tuned amplifiers, stability of tuned amplifiers, and neutralization methods. The later part of the book incorporates the detailed analysis of various wave shaping circuits, including high pass and low pass RC and RL circuits, clipper and clamper circuits, bistable, monostable, and astable multivibrator circuits. The discussion of Schmitt trigger circuits and UJT is also included in the book.

Finally, the book explains the class A, B, and C types of power amplifiers along with the discussion of the elimination of cross-over distortion. The book also covers the concepts of power amplifiers using power MOSFET and various types of d.c. to d.c. converters. The book uses plain and lucid language to explain each topic. The variety of solved examples is the feature of this book. The book explains the philosophy of the subject, which makes the understanding of the concepts very clear and makes the subject more interesting.

Electronic Measurements and Instrumentation Technical Publications

System Identification shows the student reader how to approach the system identification problem in a systematic fashion. The process is divided into three basic steps: experimental design and data collection; model structure selection and parameter estimation; and model validation, each of which is the subject of one or more parts of the text. Following an introduction on system theory, particularly in relation to model representation and model properties, the book contains four parts covering: • data-based identification – non-parametric methods for use when prior system knowledge is very limited; • time-invariant identification for systems with constant parameters; • time-varying systems identification, primarily with recursive estimation techniques; and • model validation methods. A fifth part, composed of appendices, covers the various aspects of the underlying mathematics needed to begin using the text. The book uses essentially semi-physical or gray-box modeling methods although data-based, transfer-function system descriptions are also introduced. The approach is problem-based rather than rigorously mathematical. The use of finite input-output data is demonstrated for frequency- and time-domain identification in static, dynamic, linear, nonlinear, time-invariant and time-varying systems. Simple examples are used to show readers how to perform and emulate the identification steps involved in various control design methods with more complex illustrations derived from real physical, chemical and biological applications being used to demonstrate the practical applicability of the methods described. End-of-chapter exercises (for which a downloadable instructors' Solutions Manual is available from fill in URL here) will both help students to assimilate what they have learned and make the book suitable for self-tuition by practitioners looking to brush up on modern techniques. Graduate and final-year undergraduate students will find this text to be a practical and realistic course in system identification that can be used for assessing the processes of a variety of engineering disciplines. System Identification will help academic instructors teaching control-related to give their students a good understanding of identification methods that can be used in the real world without the encumbrance of undue mathematical detail.

Electronic Circuits II S. Chand Publishing

The book covers all the aspects of Network Analysis for undergraduate course. The book provides comprehensive coverage of network analysis and simplification techniques, network theorems, graph theory, transient analysis, filters, attenuators, Laplace transform, network functions and two port network parameters with the help of large number of solved problems. The book starts with explaining the various network simplification techniques including mesh analysis, node analysis and source shifting. The basics of a.c. fundamentals are also explained in support. The book covers the various network theorems. Then the book explains the graph theory, its application in network analysis along with the concept of duality. The transient analysis of various networks is also explained in the book. The book incorporates the detailed discussion of resonant circuits. The book also explains the theory of four terminal networks, filters and attenuators. The Laplace transform plays an important role in the network analysis. The chapter on Laplace transform includes properties of Laplace transform and its application in the network analysis. The book includes the discussion of network functions of one and two port networks. The book covers the various aspects of two port network parameters along with the conditions of symmetry and reciprocity. It also derives the interrelationships between the two port network parameters. The book uses plain and lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. The variety of

solved examples is the feature of this book. The book explains the philosophy of the subject which makes the understanding of the subject very clear and makes the subject more interesting. The students have to omit nothing and possibly have to cover nothing more.

System Identification Technical Publications

The book covers all the aspects of theory, analysis, and design of Electronic Circuits for the undergraduate course. It provides all the essential information required to understand the operation and perform the analysis and design of a wide range of electronic circuits, including MOSFET as a switching and amplifier circuits, feedback amplifiers, oscillators, voltage regulators, operational amplifiers and its applications, DAC, ADC, and Phase-Locked Loop. The book is divided into four parts. The first part focuses on the fundamental concepts of MOSFET, MOSFET construction, characteristics, and circuits - as a switch, as a resistor/diode, as an amplifier, and current sink and source circuits. The second part focuses on the analysis of voltage-series and current-series feedback amplifiers. It also explains the Barkhausen criterion for oscillation and incorporates the detailed analysis of Wien bridge and phase-shift oscillators. The third part is dedicated to the basics of op-amp and a discussion of a variety of its applications. The fourth part focuses on the V to I and I to V Converters, DAC and ADC, and Phase-Locked Loop. The book uses straightforward and lucid language to explain each topic. The book provides the logical method of describing the various complicated issues and stepwise methods to make understanding easy. The variety of solved examples is the feature of this book. The book explains the subject's philosophy, which makes understanding the concepts evident and makes the subject more interesting.

Transmission Lines & Waveguides Technical Publications

The importance of measuring instruments and transducers is well known in the various engineering fields. The book provides comprehensive coverage of various electrical and electronic measuring instruments, transducers, data acquisition system, storage and display devices. The book starts with explaining the theory of measurement including characteristics of instruments, classification, standards, statistical analysis and limiting errors. Then the book explains the various electrical and electronic instruments such as PMMC, moving iron, electro-dynamometer type, energy meter, wattmeter, digital voltmeters and multimeters. It also includes the discussion of various magnetic measurements, instrument transformers, power factor meters, frequency meters, phase meters and synchros. The book further explains d.c. and a.c. potentiometers and their applications. The book teaches various d.c. and a.c. bridges along with necessary derivations and phasor diagrams. The book incorporates the various storage and display devices such as, recorders, plotters, printers, oscilloscopes, LED, LCDs and dot matrix displays. The chapter on transducers is dedicated to the detailed discussion of various types of transducers such as resistive, capacitive, strain gauges, RTD, thermistors, inductive, LVDT, thermocouples, piezoelectric, photoelectric and digital transducers. It also adds the discussion of optical fiber sensors. The book also includes good coverage of data acquisition system, data loggers, DACs and ADCs. Each chapter starts with the background of the topic. Then it gives the conceptual knowledge about the topic dividing it in various sections and subsections. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Modern Control Theory Technical Publications

The importance of electric motors is well known in the various engineering fields. The book provides comprehensive coverage of the various types of electric motors including d.c. motors, three phase and single phase induction motors, synchronous motors, universal motor, a.c. servomotor, linear induction motor and stepper motors. The book covers all the details of d.c. motors including torque equation, back e.m.f., characteristics, types of starters, speed control methods and applications. The book also covers the various testing methods of d.c. motors such as Swinburne's test, brake test, retardation test, field test and Hopkinson's test. The book further explains the three phase induction motors in detail. It includes the production of rotating magnetic field, construction, working, effect of slip, torque equation, torque ratios, torque-slip characteristics, losses, power flow, equivalent circuit, effect of harmonics on the performance, circle diagram and applications. This chapter also includes the discussion of induction generator. The book teaches the various starting methods and speed control methods of three phase induction motors. The book incorporates the explanation of various single phase induction motors. The chapter on synchronous motor provides the detailed discussion of construction, working principle, behavior on load, analysis of phasor diagram, Vee and Inverted Vee curves, hunting,

synchronous condenser and applications. The book also teaches the various special machines such as single phase commutator motors, universal motor, a.c. servomotor, linear induction motor and stepper motors. The book uses plain, lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. Each chapter is well supported with necessary illustrations, self explanatory diagrams and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Principles Of Control Systems Technical Publications

The importance of transformers and generators is well known in the various engineering fields. The book provides comprehensive coverage of the various types of transformers, d.c. generators and synchronous generators (alternators). The book starts with the brief review of single phase transformer. It continues to discuss no load and on load performance of transformers, phasor diagrams, equivalent circuit, voltage regulation and all day efficiency of transformer. The detailed discussion of open and short circuit tests and predetermination of regulation and efficiency is also included in the book. The chapter on three phase transformer provides the detailed discussion of construction, three phase transformer connections and phasor groups. The book also explains parallel operation of transformers, tap changing transformer, autotransformers, cooling of transformers and three winding transformer. The various testing methods of transformers are also incorporated in the book. The book covers all the details of d.c. generators including construction, armature reaction, commutation, characteristics and applications. The chapters on synchronous generators start with the explanation of basics of synchronous generators including construction, winding details, e.m.f. equation and effect of harmonics on induced e.m.f. The book then explains the concept of armature reaction, phasor diagrams, regulation and various methods of finding the regulation of alternator. Stepwise explanation and simple techniques used to elaborate these methods is the feature of this book. The book further explains the concept of synchronization of alternators, two reaction theory and parallel operation of alternators. The book uses plain, lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. Each chapter is well supported with necessary illustrations, self explanatory diagrams and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Electrical Measurements Technical Publications

The importance of electronic measuring instruments and transducers is well known in the various engineering fields. The book provides comprehensive coverage of various electronic measuring instruments, transducers, data acquisition system, oscilloscopes and measurement of physical parameters. The book starts with explaining the theory of measurement including characteristics of instruments, classification, statistical analysis and limiting errors. Then the book explains the various analog and digital instruments such as average and true rms responding voltmeters, chopper and sampling voltmeter, types of digital voltmeters, multimeter and ohmmeter. It also includes the discussion of high frequency impedance measurement. The book further explains types of signal generators and various signal analyzers such as wave analyzer, logic analyzer, distortion analyzer and power analyzer. The book teaches various d.c. and a.c. bridges along with necessary derivations and phasor diagrams. The book incorporates the discussion of various types of conventional and special purpose oscilloscopes. The book includes the discussion of time and frequency measurement and types of recorders. The chapter on transducers is dedicated to the detailed discussion of various types of transducers. The book also includes the measurement of various physical parameters such as flow, displacement, velocity, force, pressure and torque. Finally, it incorporates the discussion of data acquisition system. Each chapter gives the conceptual knowledge about the topic dividing it in various sections and subsections. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Transformers and Generators Technical Publications

The importance of various electrical machines is well known in the various engineering fields. The book provides comprehensive coverage of the synchronous generators (alternators), synchronous motors, three phase and single phase induction motors and various special machines. The book is structured to cover the key aspects of the course Electrical Machines - II. The book starts with the explanation of basics of synchronous generators including construction, winding details and e.m.f.

equation. The book then explains the concept of armature reaction, phasor diagrams, regulation and various methods of finding the regulation of alternator. Stepwise explanation and simple techniques used to elaborate these methods is the feature of this book. The book further explains the concept of synchronization of alternators, two reaction theory and parallel operation of alternators. The chapter on synchronous motor provides the detailed discussion of construction, working principle, behavior on load, analysis of phasor diagram, Vee and Inverted Vee curves, hunting and applications. The book further explains the three phase induction motors in detail. It includes the construction, working, effect of slip, torque equation, torque ratios, torque-slip characteristics, losses, power flow, equivalent circuit, effect of harmonics on the performance and applications. This chapter includes the discussion of induction generator and synchronous induction motor. The detailed discussion of circle diagram is also included in the book. The book teaches the various starting methods, speed control methods and electrical braking methods of three phase induction motors. Finally, the book gives the explanation of various single phase induction motors and special machines such as reluctance motor, hysteresis motor, repulsion motor, servomotors and stepper motors. The discussion of magnetic levitation is also incorporated in the book. The book uses plain, lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. Each chapter is well supported with necessary illustrations, self explanatory diagrams and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Electromagnetic Field Theory Technical Publications

The importance of Electrical Circuit Analysis is well known in the various engineering fields. The book provides comprehensive coverage of mesh and node analysis, various network theorems, analysis of first and second order networks using time and Laplace domain, steady state analysis of a.c. circuits, coupled circuits and dot conventions, network functions, resonance and two port network parameters. The book starts with explaining the network simplification techniques including mesh analysis, node analysis and source shifting. Then the book explains the various network theorems and concept of duality. The book also covers the solution of first and second order networks in time domain. The sinusoidal steady state analysis of electrical circuits is also explained in the book. The book incorporates the discussion of coupled circuits and dot conventions. The Laplace transform plays an important role in the network analysis. The chapter on Laplace transform includes properties of Laplace transform and its application in the network analysis. The book includes the discussion of network functions of one and two port networks. The book incorporates the detailed discussion of resonant circuits. The book covers the various aspects of two port network parameters along with the conditions of symmetry and reciprocity. It also derives the interrelationships between the two port network parameters. The book uses plain and lucid language to explain each topic. Each chapter gives the conceptual knowledge about the topic dividing it in various sections and subsections. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. The variety of solved examples is the feature of this book. The book explains the philosophy of the subject which makes the understanding of the subject very clear and makes the subject more interesting.

Electrical Technology Springer Science & Business Media

This book presents a gradual path toward "educating" readers in understanding how Control Systems truly operate and in recognizing, simulating and improving them in all fields of activity. Starting from the hypothesis that knowledge of Control Systems is not only a technical fact but also represents a discipline - that is, "A discipline is a developmental path for acquiring certain skills or competencies. (...) To practice a discipline is to be a lifelong learner. You "never arrive"; you spend your life mastering disciplines." (Senge, 2006, p. 10) - Piero Mella has set the objective of making Control Systems a topic that is, in a certain sense, simple and attractive by turning to the effective symbolism typical of Systems Thinking models and avoiding too technical and formal a treatment of the subject. Thus readers should know that this is not an engineering, physics, biology or economics text, nor a mathematics one either. Technical or mathematical tools are not necessary to construct Control Systems; instead the book adopts a highly simple and universal logic behind the notion itself of control process and the simple and universal action of the Control Systems that produce this process. The Magic Ring: Systems Thinking Approach to Control Systems is divided into 10 chapters. Chapter 1 seeks to review the basic language of Systems Thinking and the models it allows us to create, while Chapter 2 introduces the control process, presenting the theoretical structure of four simple Control Systems we all can observe and

manage. In Chapter 3 a general typology of Control Systems is proposed with examples taken from observations of reality. The view of Control Systems is broadened in Chapter 4 by introducing two important generalizations: 1. multi lever Control Systems, with levers that are independent or dependent of each other; 2. multi-objective systems, with independent or interdependent objectives. Chapter 5 outlines the guidelines for recognizing, observing or designing Control Systems and presents the problems that arise regarding their logical realization, introducing the fundamental distinction between symptomatic and structural control. Chapters 6-9 undertake a “mental journey” through various “environments”, increasingly broader in scope, suggesting to the reader how to recognize therein Control Systems that, by their ubiquitous presence, make the world possible in all its manifestations. Finally Chapter 10 covers ideas about a Discipline of Control Systems and the human aspects of control.

Dynamics and Control of Process Systems 2004 Technical Publications

The importance of various electrical machines is well known in the various engineering fields. The book provides comprehensive coverage of the magnetic circuits, magnetic materials, single and three phase transformers and d.c. machines. The book is structured to cover the key aspects of the course Electrical Machines - I. The book starts with the explanation of basics of magnetic circuits, concepts of self and mutual inductances and important magnetic materials. Then it explains the fundamentals of single phase transformers including the construction, phasor diagram, equivalent circuit, losses, efficiency, methods of cooling, parallel operation and autotransformer. The chapter on three phase transformer provides the detailed discussion of construction, connections, phasor groups, parallel operation, tap changing transformer and three winding transformer. The various testing methods of transformers are also incorporated in the book. The book further explains the concept of electromechanical energy conversion including the discussion of singly and multiple excited systems. Then the book covers all the details of d.c. generators including construction, armature reaction, commutation, characteristics, parallel operation and applications. The book also includes the details of d.c. motors such as characteristics, types of starters, speed control methods, electric braking and permanent magnet d.c. motors. Finally, the book covers the various testing methods of d.c. machines including Swinburne's test, brake test, retardation test and Hopkinson's test. The book uses plain, lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. Each chapter is well supported with necessary illustrations, self-explanatory diagrams and variety of solved problems. All the chapters are arranged in a proper sequence that permits each topic to build upon earlier studies. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Basic Electrical Engineering Technical Publications

The Text book is arranged so that it can be used for self-study by the engineering in practice. Included are as many examples of feedback control system in various areas of practice while maintaining a strong basic feedback control text that can be used for study in any of the various branches of engineering.

Electric Motors Technical Publications

The book is written for an undergraduate course on the Modern Control Systems. It provides comprehensive explanation of state variable analysis of linear control systems and analysis of nonlinear control systems. Each chapter starts with the background of the topic. Then it gives the conceptual knowledge about the topic dividing it in various sections and subsections. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting. The book starts with explaining the concept of state variable and state model of linear control systems. Then it explains how to obtain the state models of various types of systems using phase variables, canonical variables, Jordan's canonical form and cascade programming. Then the book includes good coverage of the matrix algebra including eigen values, eigen vectors, modal matrix and diagonalization. It also includes the derivation of transfer function of the system from its state model. The book further explains the solution of state equations including the concept of state transition matrix. It also includes the various methods of obtaining the state transition matrix such as Laplace transform method, Power series method, Cayley Hamilton method and Similarity transformation method. It further includes the detailed discussion of controllability and observability of systems. It also provides the discussion of pole placement technique of system design. The book teaches various types of nonlinearities and the nonlinear systems. The book covers the fundamental knowledge of analysis of nonlinear systems using phase plane method, isocline method and delta method. Finally, it explains stability analysis of nonlinear systems and Liapunov's stability analysis.

Electrical Circuit Analysis Technical Publications

The importance of network analysis and synthesis is well known in the various engineering fields. The book provides comprehensive coverage of the signals and network analysis, network functions and two port networks, network synthesis and active filter design. The book is structured to cover the key aspects of the course Network Analysis & Synthesis. The book starts with explaining the various types of signals, basic concepts of network analysis and transient analysis using classical approach. The Laplace transform plays an important role in the network analysis. The chapter on Laplace transform includes properties of Laplace transform and its application in the network analysis. The book includes the discussion of network functions of one and two port networks. The book covers the various aspects of two port network parameters along with the conditions of

symmetry and reciprocity. It also derives the interrelationships between the two port network parameters. The network synthesis starts with the realizability theory including Hurwitz polynomial, properties of positive real functions, Sturm's theorem and maximum modulus theorem. The book covers the various aspects of one port network synthesis explaining the network synthesis of LC, RC, RL and RLC networks using Foster and Cauer forms. Then it explains the elements of transfer function synthesis. Finally, the book illustrates the active filter design. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The explanations are given using very simple and lucid language. All the chapters are arranged in a specific sequence which helps to build the understanding of the subject in a logical fashion. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Fault-Tolerant Process Control Technical Publications

The book is written for an undergraduate course on the Basic Electrical Engineering. It provides comprehensive explanation of theory and practice of electrical engineering. It elaborates various aspects of d.c. and a.c. circuit analysis, magnetic circuits, measuring instruments, single phase transformers and various electrical machines. The book starts with the concepts of electric charge, current and potential difference. It explains Kirchhoff's laws, star-delta transformation, mesh analysis and node analysis. It also covers the application of various network theorems in analyzing d.c. circuits. The book incorporates detailed discussion of steady state analysis of single-phase series and parallel a.c. circuits along with the resonance. The book also explains the three phase balanced circuits, three phase power measurement and power factor improvement. The simple techniques and stepwise methods used to explain the phasor diagrams is the feature of the book. The book teaches the theory of various electrical measuring instruments. The book also covers the concept of earthing and electrical safety, which is most important while dealing with the electrical equipment's. The book also includes the discussion of magnetic circuits, self and mutual inductances and magnetic hysteresis. The book further explains the details of single-phase transformers and various electrical machines such as d.c. machines, three phase and single-phase induction motors and synchronous machines. The brief introduction of power system is also incorporated in the book. The book uses plain, lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. All the chapters are arranged in a proper sequence that permits each topic to build upon earlier studies. The variety of solved examples is the feature of this book which helps to inculcate the knowledge of the basic electrical engineering in the students. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.