

## Lecture Notes Electronics Engineering

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*AETA 2019 - Recent Advances in Electrical Engineering and Related Sciences: Theory and Application* Springer

This book presents selected papers from the 2021 International Conference on Electrical and Electronics Engineering (ICEEE 2020), held on January 2–3, 2021. The book focuses on the current developments in various fields of electrical and electronics engineering, such as power generation, transmission and distribution; renewable energy sources and technologies; power electronics and applications; robotics; artificial intelligence and IoT; control, automation and instrumentation; electronics devices, circuits and systems; wireless and optical communication; RF and microwaves; VLSI; and signal processing. The book is a valuable resource for academics and industry professionals alike.

*Basic Electronics Engineering* Springer Science & Business Media

This book includes my lecture notes for electrical machines course. The book is divided to different learning parts Part 1- Apply basic physical concepts to explain the operation and solve problems related to electrical machines. Part 2- Explain the principles underlying the performance of three-phase electrical machines. Part 3- Analyse, operate and test three-phase induction machines. Part 4- Investigate the performance, design, operation, and testing of the three-phase synchronous machine. Part 1: Apply basic physical concepts to explain the operation and solve problems related to electrical machines. Describe the construction of simple magnetic circuits, both with and without an air gap. Explain the basic laws which govern the electrical machine operation, such as Faraday's Law, Ampere-Biot-Savart's Law, and Lenz's Law. Apply Faraday's Law of electromagnetic induction, Ampere-Biot-Savart's Law, and Lenz's Law to solve for induced voltage and currents in relation to simple magnetic circuits with movable parts. Illustrate the principle of the electromechanical energy conversion in magnetic circuits with movable parts. Part 2: Explain the principles underlying the performance of three-phase electrical machines. Compare and contrast concentric and distributed windings in three-phase electrical machines. Identify the advantages of distributed windings applied to three-phase machines. Explain how the pulsating and rotating magnetic fields are produced in distributed windings. Calculate the synchronous speed of a machine based on its number of poles and frequency of the supply. Describe the process of torque production in multi-phase machines. Part 3: Analyse, operate and test three-phase induction machines. Calculate the slip of an induction machine given the operating and synchronous speeds. Calculate and compare between different torques of a three-phase induction machine, such as the locked rotor or starting torque, pull-up torque, breakdown torque, full-load torque or braking torque. Develop and manipulate the equivalent circuit model for the three-phase induction machine. Analyse, and test experimentally, the torque-speed and current-speed characteristics of induction machines. and discuss the effects of varying such motor parameters as rotor resistance, supply voltage and supply

frequency on motor torque-speed characteristics. Perform no-load and blocked rotor tests in order to determine the equivalent circuit parameters of an induction machine. Explore various techniques to start an induction motor. Identify the applications of the three-phase induction machines in industry and utility. Classify the insulations implemented in electrical machines windings and identify the factors affecting them. Part 4. Investigate the performance, design, operation, and testing of the three-phase synchronous machine. Describe the construction of three-phase synchronous machines, particularly the rotor, stator windings and the rotor saliency. Develop and manipulate an equivalent circuit model for the three-phase synchronous machine. Sketch the phasor diagram of a non-salient poles synchronous machine operating at various modes operation, such as no-load operation, motor operation, and generator operation. Investigate the influence of the rotor saliency on machine performance. Perform open and short circuit tests in order to determine the equivalent circuit parameters of a synchronous machine. Identify the applications of the three-phase synchronous machines in industry and utility List and explain the conditions of parallel operation of a group of synchronous generators. Evaluate the performance of the synchronous condenser and describe the power flow control between a synchronous condenser and the utility in both modes: over and under excited. Explain the principles of controlling the output voltage and frequency of a synchronous generator.

*Advanced Electrical and Electronics Engineering* Dr. Hidaia Mahmood Alassouli

The book is a collection of best papers presented in the Second International Conference on Microelectronics Electromagnetics and Telecommunication (ICMEET 2016), an international colloquium, which aims to bring together academic scientists, researchers and research scholars to discuss the recent developments and future trends in the fields of microelectronics, electromagnetics and telecommunication. Microelectronics research investigates semiconductor materials and device physics for developing electronic devices and integrated circuits with data/energy efficient performance in terms of speed, power consumption, and functionality. The book discusses various topics like analog, digital and mixed signal circuits, bio-medical circuits and systems, RF circuit design, microwave and millimeter wave circuits, green circuits and systems, analog and digital signal processing, nano electronics and giga scale systems, VLSI circuits and systems, SoC and NoC, MEMS and NEMS, VLSI digital signal processing, wireless communications, cognitive radio, and data communication.

*Fundamentals of Digital Electronics* Dr. Hidaia Mahmood Alassouli 2010 First International Conference on Electrical and Electronics Engineering was held in Wuhan, China December 4-5. Advanced Electrical and Electronics Engineering book contains 72 revised and extended research articles written by prominent researchers participating in the conference. Topics covered include, Power Engineering, Telecommunication, Control engineering, Signal processing, Integrated circuit, Electronic amplifier, Nano-technologies, Circuits and networks, Microelectronics, Analog circuits, Digital circuits, Nonlinear circuits, Mixed-mode circuits, Circuits design, Sensors, CAD tools, DNA computing, Superconductivity circuits. Electrical and Electronics Engineering will offer the state of art of tremendous advances in Electrical and Electronics Engineering and also serve as an excellent reference work for researchers and graduate students working with/on Electrical and Electronics Engineering. *Lecture Notes in Analog Electronics* Springer

This book includes my lecture notes for electrical power transmission course. The power transmission process, from generation to distribution is described and expressions for resistance, inductance and capacitance of high-voltage power transmission lines are developed used to determine the equivalent circuit of a three-phase transmission line. The book is divided to different learning outcomes Part 1- Describe the power transmission process, from generation to distribution. Part 2- Develop expressions for resistance, inductance and capacitance of high-voltage power transmission lines and determine the equivalent circuit of a three-phase transmission line. Part 1: Describe the power transmission process, from generation to distribution. Describe the components of an electrical power system. Identify types of power lines, standard voltages, and components of high-voltage transmission lines (HVTL). Describe the construction of a transmission line, galloping lines, corona effect, insulator pollution, and lightning strikes. Explain transmission system stability in regards to power transfer, power flow division, and transfer impedance. Part 2: Develop expressions for resistance, inductance and capacitance of high-voltage power transmission lines and determine the equivalent circuit of a three-phase transmission line. List the types of conductors used in power transmission line. Develop the expression for the inductance and capacitance of a simple, single-phase, two wire transmission line composed of solid round conductors. Deduce the expression for the inductance and capacitance of a simple, single-phase composite (stranded) conductor line. Derive the expression for the inductance and capacitance of three-phase lines having symmetrically and asymmetrically spacing and for bundled conductors. Discuss the effect of earth on the capacitance of three-phase transmission lines. Derive the short transmission lines models and medium transmission lines models.

*Smart Sensors and Sensing Technology* Springer Nature

Logic circuits are becoming increasingly susceptible to probabilistic behavior caused by external radiation and process variation. In addition, inherently probabilistic quantum- and nano-technologies are on the horizon as we approach the limits of CMOS scaling. Ensuring the reliability of such circuits despite the probabilistic behavior is a key challenge in IC design---one that necessitates a fundamental, probabilistic reformulation of synthesis and testing techniques. This monograph will present techniques for analyzing, designing, and testing logic circuits with probabilistic behavior. *Advances in Electrical Engineering and Electrical Machines* Springer

This book presents the fundamentals of digital electronics in a focused and comprehensive manner with many illustrations for understanding of the subject with high clarity. Digital Signal Processing (DSP) application information is provided for many topics of the subject to appreciate the practical significance of learning. To summarize, this book lays a foundation for students to become DSP engineers.

*Future Information Technology - II* Springer

This book presents the proceedings of ICCEE 2019, held in Kuala Lumpur, Malaysia, on 29th – 30th April 2019. It includes the latest advances in electrical engineering and electronics from leading experts around the globe.

*Lecture Notes of Power Electronics Course* Springer Nature The book opens a magic miniature world of electronics to the reader. The book addresses what small means in terms of electronics and what clean means in terms of modern electronic technology. Consequently, the reader understands why the most advanced civilization of the ancient world – the Egyptians – was not capable to do electronics. The book also discusses functionalities of the low-voltage electronic components with the aim to implement them in electronic circuit design. At the same time, it also opens the space of electronic component design to the readers be it discrete or integrated. The book has an introduction section, 11 chapters, an appendix, index, and list of literature. Appendix A discusses a set of solved problems, Appendix B presents SPICE simulation examples, and Appendix C presents component numbering in marketing environment.

*Transmission of Electrical Power* Springer Science & Business Media Power Electronics is a field which combines Power (electric power), Electronics and Control systems. Power engineering deals with the static and rotating power equipment for the generation, transmission and distribution of electric power. Electronics deals with the study of solid state semiconductor power devices and circuits for Power conversion to meet the desired control objectives (to control the output voltage and output power). Power electronics may be defined as the subject of applications of solid state power semiconductor devices (Thyristors) for the control and conversion of electric power. Power electronics deals with the study and design of Thyristorised power controllers for a variety of applications like Heat control,

Light/Illumination control, Motor control, AC/DC motor drives used in industries, High voltage power supplies, Vehicle propulsion systems, and High voltage direct current (HVDC) transmission.

Electrical Machines Springer Science & Business Media

This book contains a selection of papers presented at the Second National Conference on Sensors held in Rome 19-21 February 2014. The conference highlighted state-of-the-art results from both theoretical and applied research in the field of sensors and related technologies. This book presents material in an interdisciplinary approach, covering many aspects of the disciplines related to sensors, including physics, chemistry, materials science, biology and applications.

Lecture Notes in Analogue Electronics Springer Nature

This volume contains contributions from participants in the 2007 International Multiconference of Engineers and Computer Scientists. It covers a variety of subjects in the frontiers of intelligent systems and computer engineering and their industrial applications. The book reflects the tremendous advances in communication systems and electrical engineering. The book provides an excellent reference work for researchers and graduate students working in the field.

Lecture Notes in Electrical Engineering Springer Science & Business Media

A large international conference in Electrical Engineering and Applied Computing was just held in London, 30 June – 2 July, 2010. This volume will contain revised and extended research articles written by prominent researchers participating in the conference. Topics covered include Control Engineering, Network Management, Wireless Networks, Biotechnology, Signal Processing, Computational Intelligence, Data Mining, Computational Statistics, Internet Computing, High Performance Computing, and industrial applications. The book will offer the states of arts of tremendous advances in electrical engineering and applied computing and also serve as an excellent reference work for researchers and graduate students working on electrical engineering and applied computing. Proceedings of 2nd International Conference on Micro-Electronics, Electromagnetics and Telecommunications Dr. Hidaia Mahmood Alassouli

Stormy development of electronic computation techniques (computer systems and software), observed during the last decades, has made possible automation of data processing in many important human activity areas, such as science, technology, economics and labor organization. In a broadly understood technology area, this development led to separation of specialized forms of using computers for the design and manufacturing processes, that is: – computer-aided design (CAD) – computer-aided manufacture (CAM) In order to show the role of computer in the rest of the two applications mentioned above, let us consider basic stages of the design process for a standard piece of electronic system, or equipment: – formulation of requirements concerning user properties (characteristics, parameters) of the designed equipment, – elaboration of the initial, possibly general electric structure, – determination of mathematical model of the system on the basis of the adopted electric structure, – determination of basic responses (frequency- or time-domain) of the system, on the basis of previously established mathematical model, – repeated modification of the adopted diagram (changing its structure or element values) in case, when it does not satisfy the adopted requirements, – preparation of design and technological documentation, – manufacturing of model (prototype) series, according to the prepared documentation, – testing the prototype under the aspect of its electric properties, mechanical durability and sensitivity to environment conditions, – modification of prototype documentation, if necessary, and handing over the documentation to series production. The most important stages of the process under discussion are illustrated in Fig. 1. xi xii Introduction Fig. 1.

Foundations of Future Electronics diplom.de

This book is primarily designed to serve as a textbook for undergraduate students of electrical, electronics, and computer engineering, but can also be used for primer courses across other disciplines of engineering and related sciences. The book covers all the basic aspects of electronics engineering, from electronic materials to devices, and then to basic electronic circuits. The book can be used for freshman (first year) and sophomore (second year) courses in undergraduate engineering. It can also be used as a supplement or primer for more advanced courses in electronic circuit design. The book uses a simple narrative style, thus simplifying both classroom use and self study. Numerical values of dimensions of the devices, as well as of data in figures and graphs have been provided to give a real world feel to the device parameters. It includes a large number of numerical problems and solved examples, to enable students to practice. A laboratory manual is included as a supplement with the textbook material for practicals related to the coursework. The contents of this book will be useful also for students and enthusiasts interested in learning about basic electronics without the benefit of formal coursework.

Electric Power Transmission Springer Nature

This book is mostly devoted to amplification of analogue signals. It covers different technologies (bipolar, MOS, and MES), and different frequency ranges but it always deals with small signals. Analogue signals processed in electronic system may have a wide variety of origins. Among them we have the signals coming from sensors (electro-mechanical, electro-magnetic, electro-chemical, electro-acoustic, electro-optical, etc.), the signals coming from antennas being produced by another electronic system or are simply cosmic produced, and signals that are

generated within the electronic systems. The common property of most of the signals is their small amplitude. In many cases it is below a micro-volt. Since at the output of the system we most frequently need a high amplitude signal the main action undertaken in the electronic system before any further processing is to amplify.

Innovations in Electronics and Communication Engineering Springer Science & Business Media

This book presents selected, high-quality research papers from the International Conference on Electronic Systems and Intelligent Computing (ESIC 2020), held at NIT Yupia, Arunachal Pradesh, India, on 2 – 4 March 2020. Discussing the latest challenges and solutions in the field of smart computing, cyber-physical systems and intelligent technologies, it includes papers based on original theoretical, practical and experimental simulations, developments, applications, measurements, and testing. The applications and solutions featured provide valuable reference material for future product development.

Advances in Control and Communication Springer Science & Business Media

This book presents a collection of peer-reviewed articles from the 7th International Conference on Microelectronics, Circuits, and Systems – Micro 2020. The volume covers the latest development and emerging research topics of material sciences, devices, microelectronics, circuits, nanotechnology, system design and testing, simulation, sensors, photovoltaics, optoelectronics, and its different applications. This book also deals with several tools and techniques to match the theme of the conference. It will be a valuable resource for researchers, professionals, Ph.D. scholars, undergraduate and postgraduate students working in Electronics, Microelectronics, Electrical, and Computer Engineering. Frontiers in Electronic Technologies Springer Science & Business Media

Despite the fact that in the digital domain, designers can take full benefits of IPs and design automation tools to synthesize and design very complex systems, the analog designers' task is still considered as a 'handcraft', cumbersome and very time consuming process. Thus, tremendous efforts are being deployed to develop new design methodologies in the analog/RF and mixed-signal domains. This book collects 16 state-of-the-art contributions devoted to the topic of systematic design of analog, RF and mixed signal circuits. Divided in the two parts Methodologies and Techniques recent theories, synthesis techniques and design methodologies, as well as new sizing approaches in the field of robust analog and mixed signal design automation are presented for researchers and R/D engineers.

Advances in Communication Systems and Electrical Engineering Springer Science & Business Media

This book includes the original, peer-reviewed research papers from the 9th Frontier Academic Forum of Electrical Engineering (FAFEE 2020), held in Xi'an, China, in August 2020. It gathers the latest research, innovations, and applications in the fields of Electrical Engineering. The topics it covers including electrical materials and equipment, electrical energy storage and device, power electronics and drives, new energy electric power system equipment, IntelliSense and intelligent equipment, biological electromagnetism and its applications, and insulation and discharge computation for power equipment. Given its scope, the book benefits all researchers, engineers, and graduate students who want to learn about cutting-edge advances in Electrical Engineering.