Optoelectronics and photonics principles and practices by so.kasap pdf

For one-semester courses in optoelectronics and photonics, electrical engineering, physics engineering and material science and engineering. This text re-examines the huge development in the field of electrical equipment and related materials - such as Pockels modulators (Lithium Niobate). Introductory current textbooks of optoelectronic and photonic equipment suitable for mid-term or single-semester courses at bachelor level in electrical engineering, engineering physics and department of material sciences and engineering. Although it is written for undergraduates, it can also be used at graduate level as an introductory course by incorporating some of the selected topics included on the accompanying CD-ROM. It is believed that students covered the number and complex numbers and would take a basic course in semiconductor, that is, they are familiar with the basic energy-band diagrams. Principles are developed with a minimum of mathematics and emphasis on physical concepts. There are many solved problems and worked examples that relate to the concepts of practical equipment. CD-ROM: Optoelectronics and Photonics CONTENTS PROFESSIONAL COLOR OVERHEAD TRANSPARENCY DIAGRAMS All images in the textbook are accessible in PDF, Word and Power Point format. Print on any suitable color printer. Selected topics in optoelectronics and photonics color reprints educational articles from Physics Today, Physics World, IEEE Spectrum, American Journal of Physics, Laser Focus World, Photonics, IEE Review, IEE Engineering Science and Education Journal, and various educational review articles from international optoelectronics instructors and specialists covering topics in (PDF files). Diffraction, who were Fabry and Perot? Fabry-Perot optical resonators, Advances in optical communication, Chiffon, Chaos in optoelectronics, 100 GHz light switches, quantum cascade lasers, laser applications, pn junction science, flat displays, laser structures, blue lasers, nonlinear optics, optical optical amplifiers, basics of photocondivity, photoconductivity in steady state, transient photoconductivity, X-ray photoconductors, X-ray x-ray image detectors, phototative instruments, photovoltaic , Noise in electronic devices. Solved problems in optoelectronics and photonics Collection of solved problems in semiconductor science, optoelectronics and photonics (PDF files). SAFA KASAP is currently professor of electronic materials and equipment at the Department of Electrical Engineering at the University of Saskatchewan in Canada. He received B.S.E.E. (1976), M.S. (1978) and Ph.D. (1983) from the Imperial College of Science, Technology and Medicine, University of London, specializing in amorphous semiconductors and optoelectronics. In 1996, he won D.Sc. degree from the University of London for his research contributions to material science in electrical engineering. He is a member of the Institute of Electrical Engineering, the Institute of Physics and the Institute of Materials. His research interests are in amorphous semiconductors, noise in electronic devices, photoconductors, photodetectors, X-ray image detectors, laser-induced transient photocnuctivity and related topics, with more than 100 peer-reviewed journal publications in these areas. This textbook presents the first course of optoelectronic materials and equipment suitable for a half- or one-semester semester course at the higher education level in electrical engineering, engineering physics and the Department of Material Science and Engineering. It can also be used at graduate level as an introductory course by including some selected topics in the CD-ROM. Normally, students wouldn't cover maxwell's equation. Although Maxwell's equations are given in the text to alert students that they are not used in the development of principles. It is believed that students would take a basic first- or second-year physics course, with modern physics, and would have seen basic concepts in geometric optics, interference, and diffraction, but not Fresnel equations and concepts such as group speed and index groups. Typically, an optoelectronics course would either be given after a semiconductor device course or simultaneously. Students would be exposed to elementary quantum mechanical concepts, perhaps in conjunction with a basic course in semiconductor science. I tried to maintain general treatment and various evidence at a post-loctutative level without looking at detailed physics. Most topics are initially introduced through intuitive explanations to the concept to be grasped first before any mathematical development. It is assumed that the mathematical level includes vectors, complex numbers, and partial differentiation, but does not include Fourier transformations. On the one hand, we are obliged to cover as much as possible and, on the other hand, professional technical accreditation requires students to solve numerical problems and perform design calculations. In preparing the text, I tried to meet the requirements for accreditation of the engineering degree as much as possible. Obviously, you cannot solve numerical problems, perform design calculations, and derive each equation at the same time without expanding the text size to an unacceptable level. I missed many topics, but I also covered many; although, undoubtedly, my own biased choice. The book has a CD-ROM that contains images as large color diagrams in a common portable document (PDF) format. They can be printed on almost any color printer to make ceiling projector transparencies for instructor and class-ready notes for students, so they do not draw diagrams during lectures. The diagrams were also for direct delivery of lecture material from the computer. In addition, there are many selected topics and other educational features on the CD-ROM, which follows the web-format. For instructors and students, selected topics will be very useful. These selected topics have been prepared by various authors and experts in optoelectronics as separate chapters and cover a wide range of topics. Although some of these topics are treated at graduate level and review a particular area, there are also numerous selected topics at the basic level for undergraduates. In addition, some of these topics appear as color reprints of interesting articles received, with permission, from various educational journals such as Physics Today, Physics World, IEEE Spectrum, American Journal of Physics, Laser Focus, Photonics, and various other journals and journals. Many colleagues took the time to read parts of the manuscripts and provided many useful suggestions that made it a better book. My special thanks go to Professor Charbel Tannous (Brest University, France) and Dr. Yann Boucher (RESO Laboratory, Ecole Nationale d'Ingenieurs de Brest, France), who both kept challenging me with their incisive criticism and dedication to accuracy. It is my pleasure to thank Professors Dave Dodds (University of Saskatchewan), Jai Singh (Northern Territory University, Australia), Harry Ruda (University of Toronto), Fary Ghassemlooy (Sheffield-Hallam University), John McClure (University of Texas, El Paso), Rajendra Singh (Clemson University), Drs. Costas Saravanos (Siecor, Texas), Ray DeCorby, Chris Haugen (both at TRLabs, Edmonton), Don Scansen (Semiconductor Insights, Ottawa), Brad Polischuk (Anrad, Montreal) and Daniel DeForest for their valuable comments. I would also like to thank the reviewers who were commissioned by Addison-Wesley and Prentice-Hall for their helpful suggestions. And last but not least, my wife Nicolette, who was always cheerfully prepared whenever I needed her help. No textbook is perfect and I can only improve the text with your input. Please feel free to email me with your comments. While I may not be able to reply to every single comment and suggestion, I do read all my email messages and take note of suggestions and comments. S.O. Kasap Kasap@Engr.Usask.Ca Introductory textbooks of optoelectronic and photonic devices suitable for mid-term or single-semester courses at bachelor level in the departments of electrical engineering, engineering physics and material science and engineering. Although it is written for undergraduates, it can also be used at graduate level as an introductory course by incorporating some of the selected topics included on the accompanying CD-ROM. It assumes that students covered the number and complex numbers and would take a basic course of semiconductors, that is, they are familiar with energy band diagrams. Principles are developed with a minimum of mathematics and emphasis on physical concepts. There are many solved problems and worked examples that relate to the concepts of practical equipment. CD-ROM: Optoelectronics and Photonics CONTENTS PROFESSIONAL COLOR OVERHEAD TRANSPARENCY DIAGRAMS All images in the textbook are accessible in PDF, Word and Power Point format. Print on any suitable color printer. 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Solved problems in optoelectronics and photonics Collection of solved problems in semiconductor science, optoelectronics and photonics (PDF files). files).