



Optics Essentials: An Interdisciplinary Guide (Optics and Photonics)

Araz Yacoubian

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A Valuable Reference for Understanding Basic Optical Principals

Need a crash course in optics? If you are a non-specialist with little or no knowledge of optical components, systems, or hardware, who suddenly finds it necessary to work with optics in your given field, then **Optics Essentials: An Interdisciplinary Guide** is the book for you. Aimed at engineers and other interdisciplinary professionals tackling optics-related challenges, this text provides a basic overview of optical principles, concepts, and applications as well as worked examples throughout. It enables readers to gain a basic understanding of optics and sense of optical phenomena, without having to commit to extended periods of study.

Contains MATLAB® *Simulations and Suggested Experiments*

The book provides MATLAB simulations to help the reader visualize concepts, includes simple experiments using everyday materials that are readily available to solidify optical principles, and provides worked examples throughout. It contains a set of suggested experiments in each chapter designed to help the reader understand and visualize the basic principles. While this book assumes that the reader has a basic background in mathematics, it does not burden or overwhelm them with complex information or heavy mathematical equations. In addition, while it also briefly discusses advanced topics, readers are directed to the appropriate texts for more detailed study.

Comprised of 11 chapters, this illuminating text:

- Describes light sources, such as lasers, light-emitting diodes, and thermal sources
- Compares various light sources, and photometric and radiometric parameters
- Discusses light detection, including various detector types, such as photon detectors and thermal detectors, and other topics relating to light detection
- Addresses manipulation of light, and covers reflection, refraction, diffraction and interference, absorption, and scattering
- Factors in polarization
- Explores the basic principles of geometrical optics, covering ray tracing and formulation based on the assumption that light comprises of optical "rays"
- Defines imaging systems and topics related to imaging systems
- Refers to guiding light waves
- Considers various topics related to optics, electronics, software, and applications

- Covers combining optical systems with electronics and software
- Presents various optical sensing phenomena and different types of sensors

Optics Essentials: An Interdisciplinary Guide simplifies optical principles to make it easy to grasp by technical professionals that are outside of the optical field, and serves industry professionals, technical managers, researchers, and students.

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