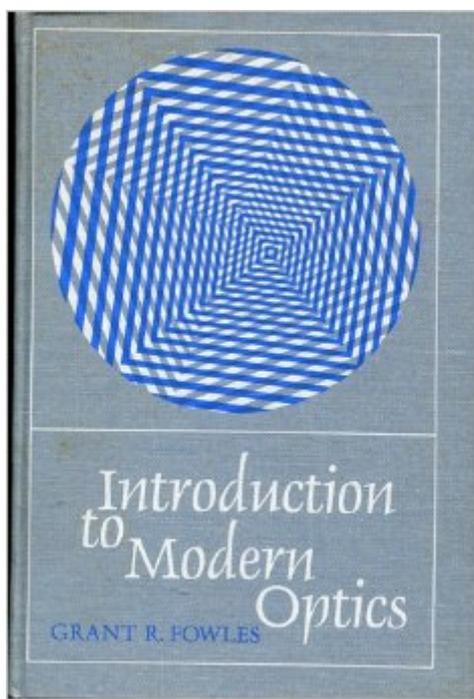


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# Introduction To Modern Optics



## Synopsis

From preface: ...The first half of the book deals essentially with physical optics, that is, the propagation of light, its vectorial nature, coherence and interference, diffraction, and the optics of solids. The remainder of the book is devoted to the emission of light by atoms, molecules and solid bodies. The quantum aspect of light is, of course, taken up in this part of the book. The final chapter is concerned with the theory of optical amplification and the use of this principle in the making of the laser. The MKS rationalized system of units is employed throughout. Recent developments, such as the applications of lasers to the study of optics, are integrated with the regular text material from the beginning. Thus in Chapter 2 there is a section on the Jones matrix and its application to the study of polarization. Chapter 3 introduces the concepts of partial coherence, Fourier transform spectroscopy, and the theory of multilayer films, in addition to conventional interference theory. Chapter 4, besides the usual theory of diffraction, treats the theory of holography and the use of the Fourier transform in the study of diffraction. Chapter 5 contains a section on nonlinear optics. In order to treat adequately the theory of light amplification, a brief introduction to quantum theory and optical spectra have been included (Chapters 6 and 7). These chapters deal with the emission of light by solid bodies (thermal radiation) and emission by atomic and molecular systems. They may be omitted in a short course if the student has taken a course in atomic physics... Contents: Chapter 1: The Propagation of light, Chapter 2: The Vectorial Nature of Light, Chapter 3: Coherence and Interference, Chapter 4: Diffraction, Chapter 5: Optics of Solids, Chapter 6: Thermal Radiation and Light Quanta, Chapter 7: Optical Spectra; Chapter 8: Amplification of Light. Lasers

## Book Information

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## Customer Reviews

If you're studying optics in a college class using Hecht's classic text, or if you are an engineer who needs an overview of the subject, this is a good practical and economical introduction to the subject. However, be aware that this book is short on two components - details of derivations of mathematical formulas and illustrations. That is not to say they do not exist, it is just to say that at several points during the book I could have been aided in my comprehension by either an illustration or derivation that simply wasn't there. There are end of chapter exercises included, and there are solutions to selected odd problems in the back of the book. However, there are no details as to how those solutions were arrived at. If you are an engineer, the only way to really be sure that you understand a subject is to solve problems. Thus I suggest Schaum's Outline of Optics by Hecht for that task. Often the solutions to problems in that outline are the mathematical details that are missing in this book! The table of contents are not included in the product description, so I add that here:

Chapter 1 The Propagation of Light  
1.1 Elementary Optical Phenomena and the Nature of Light  
1.2 Electrical Constants and the Speed of Light  
1.3 Plane Harmonic Waves. Phase Velocity  
1.4 Alternative Ways of Representing Harmonic Waves  
1.5 Group Velocity  
1.6 The Doppler Effect

Chapter 2 The Vectorial Nature of Light  
2.1 General Remarks  
2.2 Energy Flow. The Poynting Vector  
2.3 Linear Polarization  
2.4 Circular and Elliptic Polarization  
2.5 Matrix Representation of Polarization. The Jones Calculus  
2.6 Reflection and Refraction at a Plane Boundary  
2.7 Amplitudes of Reflected and Refracted Waves. Fresnel's Equations

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