Record Nr.	UNISA996216103003316
Autore	Hitz C. Breck
Titolo	Introduction to laser technology [[electronic resource] /] / Breck Hitz, J. J. Ewing, Jeff Hecht
Pubbl/distr/stampa	New York, : IEEE Press, c2001
ISBN	1-280-54204-7 9786610542048 0-471-66092-2 0-471-72312-6
Edizione	[3rd ed.]
Descrizione fisica	1 online resource (301 p.)
Altri autori (Persone)	EwingJ. J <1942-> (James J.) HechtJeff HitzC. Breck
Disciplina	621.366
Soggetti	Lasers Photonics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Rev. ed. of: Understanding laser technology, 2nd. ed. c1991. Includes index.
Nota di contenuto	Contents; Preface; Acknowledgments; Chapter 1 An Overview of Laser Technology; 1.1 What are Lasers Used For?; 1.2 Lasers in Telecommunications; 1.3 Lasers in Research and Medicine; 1.4 Lasers in Graphics and Grocery Stores; 1.5 Lasers in the Military; 1.6 Other Laser Applications; Chapter 2 The Nature of Light; 2.1 Electromagnetic Waves; 2.2 Wave-Particle Duality; Chapter 3 Refractive Index, Polarization, and Brightness; 3.1 Light Propagation-Refractive Index; 3.2 Huygens' Principle; 3.3 Polarization; 3.4 Polarization Components; 3.5 Birefringence; 3.6 Brewster's Angle; 3.7 Brightness Chapter 4 Interference4.1 What is Optical Interference?; 4.2 Everyday Examples of Optical Interference; 4.3 Young's Double-Slit Experiment; 4.4 Fabry-Perot Interferometer; Chapter 5 Laser Light; 5.1 Monochromaticity; 5.2 Directionality; 5.3 Coherence; Chapter 6 Atoms, Molecules, and Energy Levels; 6.1 Atomic Energy Levels; 6.2 Spontaneous Emission and Stimulated Emission; 6.3 Molecular Energy Levels; 6.4 Some Subtle Refinements; Chapter 7 Energy Distributions

1.

	and Laser Action; 7.1 Boltzmann Distribution; 7.2 Population Inversion; 7.3 L.A.S.E.R.; 7.4 Three-Level and Four-Level Lasers 7.5 Pumping MechanismSChapter 8 Laser Resonators; 8.1 Why a Resonator?; 8.2 Circulating Power; 8.3 Gain and Loss; 8.4 Another Perspective on Saturation; 8.5 Relaxation Oscillations; 8.6 Oscillator- Amplifiers; 8.7 Unstable Resonators; 8.8 Laser Mirrors; Chapter 9 Resonator Modes; 9.1 Spatial Energy Distributions; 9.2 Transverse Resonator Modes; 9.3 Gaussian-Beam Propagation; 9.4 A Stability Criterion; 9.5 Longitudinal Modes; Chapter 10 Reducing Laser Bandwidth; 10.1 Measuring Laser Bandwidth; 10.4 Single-Mode Lasers Chapter 11 Q-Switching11.1 Measuring the Output of Pulsed Lasers; 11.2 Q-Switching; 11.3 Types of Q-Switches; 11.4 Mechanical Q- Switches; 11.5 A-O Q-Switches; 11.6 E-O Q-Switches; 11.7 Dye Q- Switches; Chapter 12 Cavity Dumping and Modelocking; 12.1 Cavity Dumping; 12.2 Partial Cavity Dumping; 12.3 Modelocking-Time Domain; 12.4 Modelocking-Frequency Domain; 12.5 Applications of Modelocked Lasers; 12.6 Types of Modelocked Lasers; Chapter 13 Nonlinear Optics; 13.1 What is Nonlinear Optics?; 13.2 Second- Harmonic Generation; 13.3 Phase Matching; 13.4 Intracavity Harmonic Generation 13.5 Higher Harmonics13.6 Optical Parametric Oscillation; Chapter 14 Semiconductor Lasers; 14.1 Semiconductor Physics; 14.2 Modern Diode Lasers; 14.2.1 Wavelength of Diode Lasers; 14.2.2 Vertical Cavity, Surface-Emitting Lasers; 15.1.1 Lamp Pumping; 15.1.2 Thermal Issues; Chapter 16 Helium Neon, Helium Cadmium, and Ion Lasers; 16.1 Gas-Laser Transitions; 16.2 Gas Laser Media and Tubes; 16.3 Laser Excitation; 16.4 Optical Characteristics; 16.5 Wavelengths and Spectral Width; 16.6 HeNe Lasers; 16.7 Principles of HeNe Lasers 16.8 Structure of HeNe Lasers
Sommario/riassunto	Electrical Engineering Introduction to Laser Technology, Third Edition Would you like to know how a laser works, and how it can be modified for your own specific tasks? This intuitive third edition-previously published as Understanding Laser Technology, First and Second Editions-introduces engineers, scientists, technicians, and novices alike to the world of modern lasers, without delving into the mathematical details of quantum electronics. It is the only introductory text on the market today that explains the underlying physics and engineering applicable to all lasers.