Spintronics explores the spin degree of freedom of the electron to sense, store, process and transfer information in addition to the electron charge. Semiconductor spintronics promises to combine new spin enabling functionality with the present-day microelectronics and optoelectronics. It also opens the door to new generation of devices, and to the merging of electronics, photonics and magnetics. The success of spintronics relies on our ability to create and control spins. Among many obstacles, generation of electron spin polarization and coherence at room temperature is one of the most important as well as the most challenging issues, which has attracted intense research efforts during recent years. Significant progresses have been made both theoretically and experimentally, while many issues remain unresolved.

This book provides an in-depth review of the rapidly developing field of spintronic semiconductors. It covers a broad range of topics, including growth and basic physical properties of diluted magnetic semiconductors based on II-VI, III-V and IV semiconductors, recent developments in theory and experimental techniques and potential device applications; its aim is to provide postgraduate students, researchers and engineers a comprehensive overview of our present knowledge and future perspectives of spintronic semiconductors.

Contents:
- Computational Materials Design in Semiconductor Nano-Spintronics (H Katayama-Yoshida et al.)
- Transition Metal Doped ZnO (D P Norton et al.)
- Spintronics in III-Nitride Based Materials (R P Davies et al.)
- Electronic Structure and Lattice Site Location of Mn in III-Mn-V Ferromagnetic Semiconductors (K Alberi et al.)
- GaMnP Synthesized by Ion Implantation and Pulsed-Laser Melting (P R Stone et al.)
- InMnAs Thin Films and Heterostructures (B W Wessels)
- Magnetic Doping of Group-IV Semiconductors (M M Özer et al.)
- Dynamics of Localized Spins in Non-Magnetic Semiconductors (T A Kennedy)
- Zero-Bias Spin Separation (V V Bel’kov & S D Ganichev)
- Electrical Spin Injection in Hybrid Ferromagnetic Metal/Semiconductor Structures and Spin-Light Emitting Diodes (P Renucci et al.)
- Magneto-Optical Spectroscopy of Spin Injection and Spin Relaxation in Spin Light-Emitting Structures (I A Buyanova & W M Chen)

Readership: Advanced undergraduate- and graduate-level students in semiconductor physics and technology, spintronics; researchers and engineers in spintronics, semiconductor physics and technology, magnetism.

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