

# Quantum Mechanics in Physics and Chemistry with Applications to Biology

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# Reviews

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(Derick Brekke)

## QUANTUM MECHANICS IN PHYSICS AND CHEMISTRY WITH APPLICATIONS TO BIOLOGY



PHI Learning, 2011. Softcover. Book Condition: New. First edition. This book provides a comprehensive treatment of the principles and applications of quantum mechanics with equal emphasis on concept building and problem solving. The book follows an integrated approach to expose the students to applications of quantum mechanics in both physics and chemistry streams. A chapter is devoted to biological applications as well, to evince the interest of the students pursuing courses in Biotechnology and Bioinformatics. Such unique organization of the book makes it suitable for both Quantum Mechanics and Quantum Chemistry courses, where the common areas like molecular structure and spectroscopy are emphasized. The book can serve as an ideal textbook for the first-year postgraduate students of both physics and chemistry as well as for senior undergraduate students pursuing honours courses in these disciplines. The book helps students learn difficult concepts of quantum mechanics with simpler mathematics and intuitive language, but without sacrificing rigour. It has informal classroom type approach suitable for self-learning. KEY FEATURES : Gives worked-out examples and chapter-end problems with hints and answers related to different areas of modern science including biology. Highlights important technological developments based on Quantum Mechanics, such as electron microscope, scanning tunnelling microscope, lasers, Raman spectroscopy and Nuclear Magnetic Resonance (NMR). Provides adequate number of illustrations. Includes detailed mathematical derivations separately in Appendices for a more rigorous concepts. Contents Preface ? Acknowledgements ? Table of Constants ? The Periodic Table 1. Early Days of Quantum Theory and the Wave Nature of Electrons 2. The Schrödinger Equation and Operators in Quantum Mechanics 3. Particles in Potential Wells and Tunnelling through Barriers 4. The Harmonic Oscillator: A Model for Molecular Vibrations 5. The Rigid Rotator: A Model for Molecular Rotations and the Angular Momentum 6. The

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