Zinc oxide is one of the most candidate materials using in the detecting and sensing fields, physical properties such as structural, optical and electrical properties has been studied by so many researchers. This book provides an insight on the basic physical properties, [structural (as crystallite size, integral breadth, micro strain and dislocation density), optical (as transmittance absorption coefficient, extinction coefficient and energy gap), electrical (as dark and illuminated I-V characteristics)]. This book focuses on the principles of two main sensing methods, chemical and piezoelectrical. The mechanism and characterization for chemical vapors and gas sensing has been explained, also it contain the basic and simple demonstration of set-up for mechanical waves sensing depending on the some parameters as resonance frequency, band width, quality factor, damping coefficient and surface acoustic wave velocity (SAW). Finally the book shows those metal oxides especially ZnO can be used as a biomedical, mechanical or any other industrial or environmental sensors.