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This chapter reviews the recent progress of the theoretical and experimental studies of ZnO-based structures such as quantum cascade lasers, resonant-tunneling diodes, and quantum well detectors and their applications for infrared and terahertz spectral range. The role of spontaneous and piezoelectric polarization in polar ZnO-based structures and their impact on intersubband transitions and the performance of terahertz devices are discussed in detail. It is shown that ZnO-based compounds are promising materials for the fabrication of terahertz sources operating up to room temperature due to their unique properties such as their large bandgap, conduction band offset energy, and high longitudinal-optical phonon energy. Moreover, ZnO-based terahertz sources can cover the spectral region of 0.1–12 THz, which is very important for THz imaging and detection of explosive materials and medical spectroscopy applications, which could be not covered by conventional GaAs-based terahertz devices. In terms of the reported significant progress in the growth of nonpolar m-plane ZnO-based heterostructures and devices with low defect density, a wide perspective for the design and fabrication of high-power terahertz sources at room-temperature operation is now opened up.