We present quasicontinuous functions as a “natural” class of functions to bridge the various notions of topological, measure-theoretic, and computational dynamics. This class includes many commonly studied classes of discontinuous maps (piecewise expanding, interval exchange, etc.) and we show that these functions have fundamental connections to closed relations. We present results on the properties of iterated quasicontinuous maps and present hypotheses under which the Krylov-Bugolyubov theorem (existence of an invariant measure) holds. (Received July 25, 2008)