Spectral representation theory of graded composite materials K.L. Chan, C.M. Kwok, K.W. Yu, The Chinese University of Hong Kong — In graded composite materials, the physical properties can vary continuously in space and it may give different physical phenomena when compared with homogeneous materials. The Bergman-Milton spectral representation is a rigorous mathematical formalism to express the effective dielectric constant of nongraded composite materials [1]. In this study, we consider a material (rather than microsture [2]) graded composites, and generalize the Bergman-Milton spectral representation to extract the spectral density function for the effective dielectric constant of this graded composite material in the frequency domain [3]. Analytic and numerical solution will be presented for graded films and graded spheres.