In this talk we present a new approach for constructing the wavelet filter bank. Our approach enables constructing nonseparable multidimensional non-redundant wavelet filter banks using the Quillen-Suslin Theorem for Laurent polynomials. Our construction method presents some advantages over the traditional methods of multidimensional wavelet filter bank design. First, it works for any spatial dimension and for any sampling matrix. Second, it does not require the initial lowpass filters to satisfy any additional assumption such as interpolatory condition. Third, it provides an algorithm for constructing a wavelet filter bank from a single lowpass filter so that its vanishing moments are at least as many as the accuracy number of the lowpass filter. (Received August 01, 2013)