

**EE599-020**  
**Audio Signals and Systems**

**Digital Signal Processing  
(Synthesis)**

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# Filters

Filter are designed based on specifications given by:

- spectral magnitude emphasis
- delay and phase properties through the group delay and phase spectrum
- implementation and computational structures

Matlab functions for filter design

- (IIR) besself, butter, cheby1, cheby2, ellip, prony, stmcb
- (FIR) fir1, fir2, kaiserord, firls, remez, remezord, fircls, fircls1, cremez
- (Implementation) filter, filtfilt, dfilt
- (Analysis) freqz, FDATool, SPTool

# Filter Specifications

**Example:** Low-pass filter frequency response

