# Digital Filter Design Using FDATool

25.108 Intro to Engineering II

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# What is a Digital Filter

- Passes a band of frequencies and rejects other frequencies
  - Three Bands of Interest
    - Pass band, The frequencies which get through
    - Stop band, the frequencies which don't get through
    - Transition bands, the bands in which part of the frequencies get through, between stop and pass bands

# Types of Digital Filters

- Low Pass
- High Pass
- Band Pass
- Band Stop

# Filter Implementations

- Infinite Impulse Response (IIR)
  - Feedback filter
- Finite Impulse response
  - Feed Forward
- Hybrid IIR/FIR

# Key parameters in filter design

- Sampling rate

- Number of Taps

- Pass band

- Stop Band

- Stop Band Depth (rejection)

# Using FDA tool

- Type "FDATOOL" at command prompt



Sampling Frequency

Stop Band

Pass band

Out of Band Rejection

Filter Type

Compute Filter Button

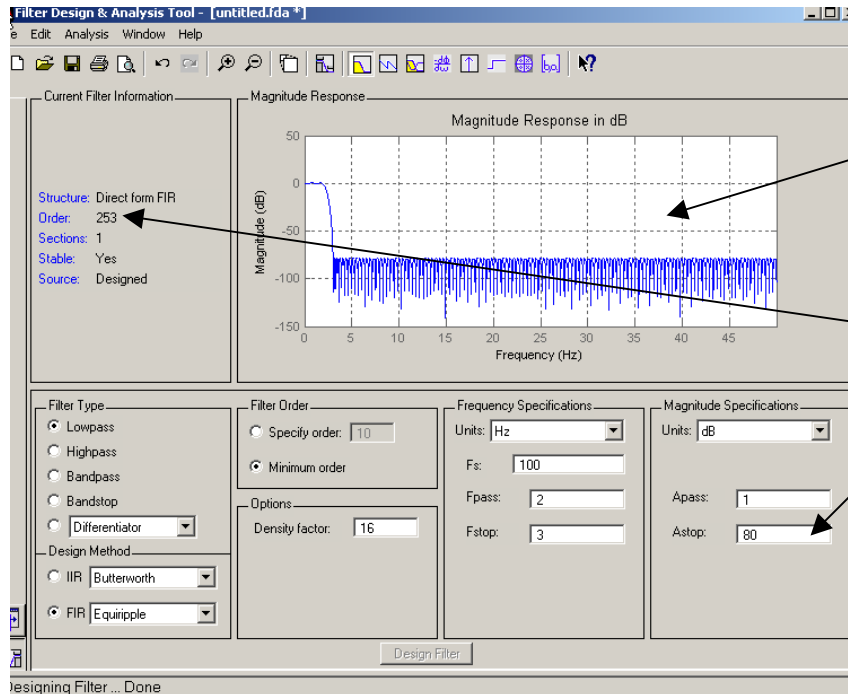Don't touch this

Digital Filter Design

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# Step 2: Enter Parameters

- Enter Sampling Frequency
- Pass Band
- Stop Band
- Leave Everything else the same

# Step 3: Design Filter
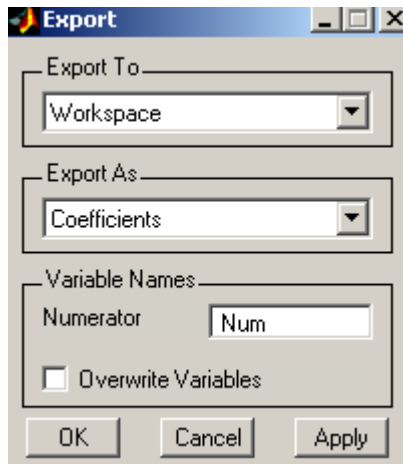
- Push "design Filter Button"

Filter Response Shown



Number of Taps, if too many, change rejection, to say 50 or 60

# Step 4: Export Coefficients

- On "File Menu" Type
  Export



Create "Num", and "Den". If you have matlab 6.5, type "Den=1"

# Step 5: do the filtering

- Type

- ">> Output=filter(Num,Den,Input)" to apply the filter you have created. It is simple as that.