# Praktikum SIE - Modul 3

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```r
library(lemon)
library(tidyverse)
library(ggplot2)
```

## 3.1 Lowpass Filter Orde 2

### 3.1.2 Frequency Response

$$F_{Cutoff} = 1000Hz$$

```r
ggplot(LPF_orde2_freq) +
  scale_x_log10() +
  labs(
    title = "Perbandingan Lowpass Filter Orde 2",
    subtitle = "Cutoff = 1 kHz"
  ) +
  ylab("Magnitude (dB)") +
  xlab("Frequency (Hz)") +
  geom_line(aes(FREQ, Cheby_2, color = "Cheby")) +
  geom_line(aes(FREQ, Bessel_2, color = "Bessel")) +
  geom_line(aes(FREQ, Butter_2, color = "Butterworth")) +
  geom_hline(aes(yintercept=-3, color = "-3 dB"), linetype = 2) +
  geom_vline(aes(xintercept=1000, color = "Cutoff"), linetype = 1) +
  theme_linedraw()
```

# Perbandingan Lowpass Filter Orde 2

Cutoff = 1 kHz