Fundamental of acoustics and sound

Topic 1: **Basic Audio Signal Analysis**

Basic audio signal analysis in time and frequency
Fast Fourier Transform
Time Windows
Short Time Fourier Transform and spectrograms

Important! You must have the newest version of Matlab installed before the lecture!!!

Literature: Flemming Munk “Introduction to Joint Time Frequency Analysis”,
Read page 1-12.
Read the following Matlab documentation pages:
FFT
https://se.mathworks.com/help/releases/R2025b/matlab/ref/fft.html
Windows
https://se.mathworks.com/help/releases/R2025b/signal/ug/windows.html
https://se.mathworks.com/help/releases/R2025b/signal/ref/windowdesigner-app.html
Signal Analyzer
https://se.mathworks.com/help/releases/R2025b/signal/ref/signalanalyzer-app.html
STFT (with windows)
https://se.mathworks.com/help/releases/R2025b/signal/ref/stft.html
Spectrogram
https://se.mathworks.com/help/releases/R2025b/signal/ref/spectrogram.html
Applied time frequency analysis
https://se.mathworks.com/help/releases/R2025b/signal/ug/practical-introduction-to-time-frequency-analysis.html

Optional:
This will give more deep understanding of Digital signals
Discrete and Digital Signals and Systems - An Introduction with MATLAB and Applications, Peter O’Shea , Amin Z. Sadik , Zahir M. Hussain, Chapter 1, page 3-42
Available through AUB
https://link-springer-com.zorac.aub.aau.dk/book/10.1007/978-3-642-15591-8

Exercises: Will be given during the lecture

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