Hochschule Bremerhaven
INSTITUT FÜR AUTOMATISIERUNGS- UND ELEKTROTECHNIK
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Exam Topics for ES-MED "Medical Systems"

- Physiology basics
  - body geometry and terminology
  - cells and tissue
  - cardiovascular system, heart monitoring
  - ECG analysis
- DFT and FFT (frequency analysis)
  - signals in time domain and frequency domain (real, imaginary, magnitude, phase)
  - FFT algorithm (Cooley-Tukey)
- Digital filters
  - Shannon theorem
  - Z-transform
  - discrete transfer function, filter
  - IIR filter design
  - Butterworth, Bessel, Chebychev filters
  - normalized frequency
  - PLL and PLL controller design
  - FIR filter design (lowpass, highpass, bandpass, bandstop)
  - windowing techniques (Blackman, Kaiser-Bessel)
- FAST DSP Tools
  - System Generator, Integrated Logic Analyzer (ChipScope)
  - Latency and clock speed
  - DSP simulation and auto-coding
- CORDIC
  - circular rotations
  - rotation and vectoring modes
  - generalized CORDIC (circular, linear and hyperbolic rotations)
  - mathematical function approximation
  - using CORDIC with microcontrollers