DSP programming 300 (ESP 300)

Qualification	Undergraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	4.00
NQF Level	07
Programmes	BEng Electrical Engineering
	BEng Electrical Engineering ENGAGE
Prerequisites	EPW 200, (ELI 220), (EMK 310)
Contact time	Three days
Language of tuition	Module is presented in English
Department	Electrical, Electronic and Computer Engineering
Period of presentation	Year

Module content

This module is presented during one of the recess periods in the third year of study. The module is an introduction to digital signal processors (DSPs) for electrical engineering students. The first of three days is dedicated to theory lectures introducing DSP and addressing quantisation, sampling theory, anti-aliasing filters, correlation, convolution, DFT, inverse DFT, Z- transforms, digital filters (low pass, anti-aliasing, FIR and IIR) and the design thereof. PCB layout techniques, decoupling and bypass capacitors relating to digital circuits are addressed. At the end of the theory sessions students need to design a filter. The practical work over the last two days consists of implementing the filter designed as well as coding DAC, FIR, IIR and PWM for a DSP. The DAC, FIR, IIR and PWM are implemented in hardware/firmware and the results displayed on an oscilloscope. At the end of the module each student will demonstrate a working system consisting of the developed firmware and hardware performing the required signal processing functions. Students will be informed by the Department if, for practical reasons, the module needs to be offered in a different time slot.