



University of Pretoria Yearbook 2023

DSP programming 300 (ESP 300)

Qualification	Undergraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	1.00
NQF Level	07
Programmes	BEng (Electrical Engineering) BEng (Electrical Engineering) ENGAGE
Prerequisites	(ELI 220), EMK 310 GS/ 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.

Regulations and rules

The regulations and rules for the degrees published here are subject to change and may be amended after the publication of this information.

The [General Academic Regulations \(G Regulations\)](#) and [General Student Rules](#) apply to all faculties and registered students of the University, as well as all prospective students who have accepted an offer of a place at the University of Pretoria. On registering for a programme, the student bears the responsibility of ensuring that they familiarise themselves with the General Academic Regulations

applicable to their registration, as well as the relevant faculty-specific and programme-specific regulations and information as stipulated in the relevant yearbook. Ignorance concerning these regulations will not be accepted as an excuse for any transgression, or basis for an exception to any of the aforementioned regulations.

University of Pretoria Programme Qualification Mix (PQM) verification project

The higher education sector has undergone an extensive alignment to the Higher Education Qualification Sub-Framework (HEQF) across all institutions in South Africa. In order to comply with the HEQSF, all institutions are legally required to participate in a national initiative led by regulatory bodies such as the Department of Higher Education and Training (DHET), the Council on Higher Education (CHE), and the South African Qualifications Authority (SAQA). The University of Pretoria is presently engaged in an ongoing effort to align its qualifications and programmes with the HEQSF criteria. Current and prospective students should take note that changes to UP qualification and programme names, may occur as a result of the HEQSF initiative. Students are advised to contact their faculties if they have any questions.