University of Pretoria Yearbook 2025

Electromagnetic compatibility 310 (EME 310)

Qualification	Undergraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	16.00
NQF Level	07
Programmes	BEng in Computer Engineering 4-year programme
	BEng in Computer Engineering 5-year programme
Prerequisites	No prerequisites.
Contact time	3 lectures per week, 1 tutorial per week, 9 hours practical per semester
Language of tuition	Module is presented in English
Department	Electrical, Electronic and Computer Engineering
Period of presentation	Semester 1

Module content

The module is aimed at providing computer engineering students with a background in electromagnetism and electromagnetic compatibility. Introduction: nature of electric and magnetic fields, electromagnetic spectrum, complex numbers and phasors, coordinate systems (cartesian, cylindrical, spherical). Transmission lines: lumped element model, transmission line equations, travelling versus standing waves, lossless lines, input impedance, short and open-circuited and λ/4 lines, power flow, transients on transmission lines, S-parameters. Electrodynamic fields: Maxwell's equations, plane waves in unbounded media, power density, plane waves normally incident on an interface between materials, Faraday's law. Antennas: impedance, radiation patterns, directivity, gain. Electromagnetic compatibility (EMC): sources of interference, non-ideal behaviour of passive circuit elements, EMC effects of digital signals, grounding techniques, good printed circuit layout practice, far-field shielding, power supply decoupling, ground loops, differential mode and common mode radiation, cable shielding.

Regulations, degree requirements and information

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

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 (HEQSF) 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.