University of Pretoria Yearbook 2022

Power system analysis 410 (EKK 410)

Qualification	Undergraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	16.00
NQF Level	08
Programmes	BEng (Electrical Engineering)
	BEng (Electrical Engineering) ENGAGE
Prerequisites	EKK 320 GS
Contact time	1 practical per week, 1 tutorial per week, 3 lectures per week
Language of tuition	Module is presented in English
Department	Electrical, Electronic and Computer Engineering
Period of presentation	Semester 1

Module content

This second module on power systems covers power flow (bus admittance matrix, bus impedance matrix, Gauss-Seidel and Newton Raphson methods), fault analysis (balanced fault analysis, symmetrical components, unbalanced fault analysis), power system protection (definite time, inverse-definite-minimum-time (IDMT), introduction to over-current and earth fault protection), sizing of protection devices, power system control (frequency control and voltage control), economical operation of power systems (optimal incremental cost of generation and penalty factor) and renewable energy (solar power, current and voltage curves, and maximum power point tracking (MPPT)).