



University of Pretoria Yearbook 2017

Electrical engineering 221 (EIR 221)

Qualification Undergraduate

Faculty Faculty of Engineering, Built Environment and Information Technology

Module credits 16.00

Programmes BEng Chemical Engineering

BEng Chemical Engineering ENGAGE

BEng Mechanical Engineering

BEng Mechanical Engineering ENGAGE

BEng Metallurgical Engineering

BEng Metallurgical Engineering ENGAGE

Prerequisites EBN 111 or EBN 122 and WTW 164

Contact time 1 tutorial per week, 1 practical per week, 3 lectures per week

Language of tuition Separate classes for Afrikaans and English

Academic organisation Electrical, Electronic and Com

Period of presentation Semester 2

Module content

Transient response phenomena in RC, RL and RLC circuits: Natural response and step response. Alternating current (AC) circuits: Phasors, impedances, and power in AC circuits. The application of Ohm's law, Kirchoff's circuit theorems, matrix methods, and Thevenin and Norton equivalents to sinusoidal steady-state analysis. Three-phase circuits: Balanced three-phase circuits, star/delta configurations, and three-phase power transfer calculations. Magnetically coupled circuits: Mutual inductance, coupling factor, transformers, ideal transformers and autotransformers. Application of circuit theory to induction motors: basic principles of induction motors, equivalent circuit and analysis thereof, calculation of power and torque through application of Thevenin's theorem. Synoptic introduction to other types of motors.

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