# University of Pretoria Yearbook 2021

# Electricity and electronics 122 (EBN 122)

| | |
|---|---|
| **Qualification** | Undergraduate |
| **Faculty** | Faculty of Engineering, Built Environment and Information Technology |
| **Module credits** | 16.00 |
| **NQF Level** | 05 |
| **Programmes** | BEng Chemical Engineering |
| | BEng Civil Engineering |
| | BEng Electrical Engineering |
| | BEng Electronic Engineering |
| | BEng Metallurgical Engineering |
| | BEng Mining Engineering |
| | BEng Mining Engineering ENGAGE |
| **Prerequisites** | Admission to relevant programme. |
| **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 2 |

**Module content**

Electrical quantities, units, definitions, conventions. Electrical symbols, ideal and practical current and voltage sources, controlled sources. Ohm’s law in resistive circuits, Kirchoff’s current and voltage laws, resistors in series and parallel circuits, voltage and current division, mesh current and node voltage methods. Circuit theorems: linearity, superposition, Thevenin and Norton equivalent circuits, sources transformation, power calculation, maximum power transfer. Energy storage elements: current, voltage, power and energy in inductors and capacitors, inductors and capacitors in series and parallel. Ideal operational amplifiers and applications: inverting and noninverting amplifiers, summing amplifiers, current sources, integrators.