

# **Harmonics**

## **Objective:**

The objective of the course is to provide users of Powerfactory with the relevant knowledge to effectively utilise the harmonic function.

Users will be taught how to analyse and mitigate for harmonic problems in electrical networks.

## **Pre-requisites:**

- o A good working knowledge of the basic techniques used in PowerFactory.
- o Delegates should have attended the Basic Course
- o Own Laptop ( NOTE: laptops can be supplied at an additional charge)

**Software used: PowerFactory V14.0**

**No of participants:** Minimum: 6; Maximum: 12.

**Cost:** see [www.digsilent.co.za](http://www.digsilent.co.za) for latest course fees, which includes a set of course notes, lunch and refreshments.

PowerFactory licences, pens and notepads are also supplied.

Please note the booking clauses on the registration form.

**Duration:** 2 days

## **Topics to be covered:**

### **Introduction to Harmonics**

- Power Quality
- Harmonic Sources
- Harmonic Spectrums
- Harmonic Propagation

### **Powerfactory Harmonic Models**

- Loads
- Lines/Cables
- Transformers
- Capacitor banks / shunt filters

### **Harmonic Load-Flow**

- Harmonic Indices
- Running Harmonic Load-flow in Powerfactory
- Handling of Results
- Bar-Diagrams and Waveform Plots

### **Harmonic Mitigation**

- Typical Filter Configuration
- AC Filter Design

### **Frequency Sweep**

- Parameter Characteristics
- Frequency Sweep function in Powerfactory