

“Basics of Electrical Engineering – Alternating Current”

Course Goal

You will acquire the necessary knowledge to independently understand the relationships of alternating current technology and to accomplish related tasks and perform calculations for simple circuits.

Course Content

Basic terms of alternating current technology

- > Types of alternating voltages and alternating currents
- > Why alternating current?
- > Sine wave, vector and line diagrams
- > Angular frequency

Properties of alternating voltages and alternating currents

- > Peak, instantaneous and effective value
- > Frequency and period length

Induction

- > Induction law
- > Generation of alternating voltages
- > Lenz's rule
- > Self-induction

Phase shift

- > Phase angle φ

Components and resistors in the alternating current circuit

- > Ohmic resistance in the alternating current circuit
- > Coils in the alternating current circuit
- > Inductive resistance
- > Capacitors in the alternating current circuit
- > Capacitive resistance

Power in the alternating current circuit

- > Effective power
- > Reactive power
- > Apparent power

Frequency-dependent dipoles and quadrupoles

- > Dipoles
- > Series and parallel connection of R and C
- > Series and parallel connection of R and L
- > Series connection of R, L and C
- > Parallel connection of R, L and C

Oscillating circuits

- > Series oscillating circuit
- > Parallel oscillating circuit

Filters

- > Quadrupoles
- > Low pass (RC module, LR module)
- > High pass (CR module, RL module)
- > Bandpass
- > Band elimination

High and low pass on square wave voltage

- > RC module as integrating element
- > CR module as differential element

Three-phase alternating current – rotary current

- > Generation and representation
- > Interlinking circuit
- > Power with three-phase current
- > Rotating field
- > Advantages of three-phase current over alternating current

Introduction to oscilloscope measurement technology

- > General information
- > Design and functioning of an oscilloscope
- > Operation of an oscilloscope

Practical exercises

- > Practical exercises (measurement exercises) on the various topics
- > Creation of measurement reports

Electrical accidents and their prevention

- > Causes of electrical accidents
- > Dangers of electrical current
- > Responding to electrical accidents
- > Protective measures to prevent electrical accidents

Target Group / Prior Knowledge

People who want to enter related professions in which knowledge of electricity and electrical circuits is required. The participants should be capable of understanding abstract and logical relationships. Good mathematical knowledge (lower secondary level or the module "Technical Calculation") and the module BEE Direct Current or an adequate prior education are required.

Course Length

160 instructional units

Course Price

Available on request

Course Location:

Kapsch Partner Solutions GmbH, Johann-Hoffmann-Platz 9, 1120 Vienna or
at customer site, by agreement

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