



## MOTOR DESIGN LTD

### DESIGN OF INDUCTION MACHINES (ASYNCHRONOUS MACHINES)

Training course for Engineers involved in the design and manufacture of electric motors and generators  
**Goal:** To enhance the knowledge and skills of engineers in the design and analysis of induction machines

**Date:** tba

**Location:** Motor Design Training Rooms, Ellesmere, Shropshire, UK

**Cost:** £850 (40% discount for students and additional attendees from same company)

**Language:** English

To book Call +44 (0) 1691 623305 or Email: [info@motor-design.com](mailto:info@motor-design.com)

#### DAY 1

##### Analysis Techniques for Calculation of Induction Machine Performance

###### Types of Induction Machine

- cage and wound field
- single and 3 phase
- slot and pole number
- slot shapes
- winding types

###### Performance Calculation Theory (Analytical)

- the equivalent circuit
- rotor resistance
- magnetising and leakage inductance
- torque

###### Performance Calculation Theory (Analytical) – Continued...

- saturation
- losses
- temperature rise
- etc.

###### Performance Calculation Theory (Numerical)

- FEA solver types
- losses
- torque ripple
- etc.

#### DAY 2

##### Software for Analysis of Asynchronous Machines

###### SPEED PC-IMD for design of induction machines

- the SPEED software interface
- the SPEED software analysis method
- 3-phase and single phase machines
- the equivalent circuit
- integrated FEA and algorithm calibration
- design examples

###### Motor-CAD for thermal analysis

- cooling types used in induction machines
- basic calculation theory
- Motor-CAD links to SPEED
- design examples

###### FLUX for detailed FEA electromagnetic analysis

- cage model
- torque/speed characteristic
- starting
- loss calculation
- FLUX links to SPEED – IM Overlay
- design examples

###### PORTUNUS for drive modelling

- IM model parameters
- drive system modelling
- electromagnetic and thermal models
- design examples

#### DAY 3

##### Practical Examples of Designing Induction Machines

- On this training day we demonstrate the design process using a typical application specification and design a motor to meet the requirements
- We will use several software packages in the design example
- The attendees will have the opportunity to use the different software packages themselves and to contribute suggestions of further design examples for modelling on the day