

Module Title Electrical Machines And Drives 2	Reference EN4560 SCQF SCQF Level 10 SCQF Points 15 ECTS Points 7.5 Created December 2003 Approved March 2004 Amended August 2011 Version No. 3
Keywords Two-Axis Analysis, AC Drives, Machine Simulation	

This Version is No Longer Current

The latest version of this module is available [here](#)

Prerequisites for Module

Electrical Machines and Drives 1 (EN3560) or equivalent.

Introduction to flux-vector control of ac machines

Corequisite Modules

None.

Matlab and Simulink analysis of ac machines and drive systems in steady-state and transient operation.

Precluded Modules

None.

Indicative Student Workload

Aims of Module

To provide the student with the ability to analyse the performance and operation of ac machines and drive systems, and to apply simulation techniques to aid this analysis.

	Full Time	Part Time
<i>Contact Hours</i>		
Assessment	6	6
Laboratory	9	9
Lecture	24	24
Tutorial	12	12
<i>Directed Study</i>	47	47
<i>Private Study</i>	52	52

Learning Outcomes for Module

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1. Apply 2-axis analysis to the performance of 3-phase synchronous and induction motors.
2. Understand and analyse the operation of AC drive systems as applied to 3-phase induction motors.
3. Utilise simulation tools to analyse the transient performance of AC machines.

Indicative Module Content

Salient pole synchronous machines. Principles of operation, application and analysis.

Two-axis analysis. Generalised machine theory. Application to the transient analysis of both synchronous and induction machines.

AC drives: induction motor operation on variable-voltage variable frequency supplies, principles of self-commutated, variable-frequency inverter operation, control of output voltage, frequency and

Mode of Delivery

This is a lecture-based course supplemented with tutorial sessions, laboratory work and student-centred learning.

Assessment Plan

	Learning Outcomes Assessed
Component 1	3
Component 2	1,2

Component 2 is a closed book examination. (70% weighting)

Component 1 will consist of one laboratory report. (30% weighting)

Indicative Bibliography

1. FITZGERALD, A.E., KINGSLEY, C. and UMANS, S.D., 2003. 6th ed. Electric Machinery. Singapore: McGraw-Hill
2. MOORTHY, V.R., 2005. Power Electronics. New Delhi: Oxford University Press.
3. ONG, CHEE-MUN., 1998. Dynamic Simulation of Electric Machinery. Upper Saddle River, NJ: Prentice Hall PTR

harmonics. Principles of braking and regeneration, slip energy recovery, stator voltage control, cycloconverters.