

ELEC 7003 ADVANCED ELECTRICAL MACHINES AND DRIVES

Credit Points 10

Legacy Code 300601

Coordinator Jamal Rizk ([https://directory.westernsydney.edu.au/search/name/Jamal Rizk/](https://directory.westernsydney.edu.au/search/name/Jamal%20Rizk/))

Description The subject covers various types of electrical motors and drive systems, their applications and control. The unit aims to introduce an advanced study of electrical machines and drives. It also covers application considerations and modern developments in high performance drive systems. This course covers various types of the speed control, the starting, the braking and the dynamics of different electrical machines and drives.

School Eng, Design & Built Env

Student Contribution Band HECS Band 2 10cp

Level Postgraduate Coursework Level 7 subject

Incompatible Subjects LGYA 5847 - Variable Speed Electric Drives LGYA 5844 - Special Electrical Machines

Restrictions

Students must be enrolled in a postgraduate program

Assumed Knowledge

Electric Circuits and Basic Electro magnetics.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Apply various electrical drive systems to industrial and commercial applications and discuss their requirements.
2. Analyse various types of DC and AC drives.
3. Explain new developments in control of drive systems.
4. Discuss and explain the use of various electrical motors in different electromechanical systems.

Subject Content

Introduction to machine drives. Principal characteristics and requirements. Basic Components of an Electric Drive System.
 D.C. motors. Circuit representation. Speed-torque characteristics.
 Speed Control of D.C motors
 Induction motors. Circuit representation. Speed-torque characteristics.
 Speed control of Induction Motors: voltage control, slip-energy recovery, speed control by inverters, frequency and Voltage/Frequency Control.
 Power electronic devices and basic power converters.
 Three-phase naturally commutated bridge circuit
 Braking of Electrical Motors: Regenerative, Dynamics and counter-current braking.
 Dynamics of DC and Induction Motors

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are

regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/Group Task
Assignment	25 pages which include all the circuits and graphics.	25	N	Individual
Mid-semester exam	2 hours	20	N	Individual
Final Exam	2 hours	55	N	Individual

Teaching Periods

Spring

Parramatta City - Macquarie St

Day

Subject Contact Jamal Rizk ([https://directory.westernsydney.edu.au/search/name/Jamal Rizk/](https://directory.westernsydney.edu.au/search/name/Jamal%20Rizk/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC7003_22-SPR_PC_D#subjects)