

# 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 subject 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

**Discipline** Electrical And Electronic Engineering And Technology

**Student Contribution Band** HECS Band 2 10cp

Check your fees via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**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.

Type	Length	Percent	Threshold	Individual/Group Task
Essay	25 pages which include all the circuits and graphics.	25	N	Individual
Intra-session Exam	2 hours	20	N	Individual
Final Exam	2 hours	55	N	Individual

Teaching Periods

## Spring (2023)

**Parramatta City - Macquarie St**

### On-site

**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/odd/timetable/?subject\\_code=ELEC7003\\_23-SPR\\_PC\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC7003_23-SPR_PC_1#subjects))

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