



**11 - 14 August 2017, ICC Sydney, NSW, Australia**

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**The 20<sup>th</sup> International Conference on Electrical Machines and Systems (ICEMS2017)**

**Tutorial Two**

**Introduction to Permanent Magnet AC Machines:  
Principles and Analysis**

**Time and Date:** 13:45 – 17:00 on Friday 11 August 2017  
**Venue:** Building 11, University of Technology Sydney)  
**Tutors:** Associate Professor Wen Soong  
Head, School of Electrical and Electronic Engineering  
University of Adelaide, South Australia

**Abstract**

This tutorial provides an introduction to the design of surface and interior permanent magnet machines and is a useful foundation for research work in electrical machine design. It begins with an overview of the process of electric machine design including requirements, modelling and analysis, testing and optimisation. Next it examines the properties of common magnetic and electrical materials used in machines. The third section talks about the principles of sizing electric machines and the constraints on magnetic and electric loading. The fourth section discusses alternative PM machine topologies. The final section of the talk discusses the analysis and modelling of electric machines and concludes with a finite-element case study.

**Tutor Biography**

**A/Prof. Wen L. Soong** received the B.Eng. degree from the University of Adelaide, Australia, in 1989 and the Ph.D. degree from the University of Glasgow, in 1993. He was with General Electric Corporate Research and Development, Schenectady, NY, USA, before joining the University of Adelaide in 1998, where he is currently an Associate Professor and Head of the School of Electrical and Electronic Engineering. His research interests include permanent-magnet and reluctance machines, renewable-energy generation and energy storage in power systems.