Remus Teodorescu received the Dipl.Ing. degree in electrical engineering from Polytechnical University of Bucharest, Romania in 1989, and PhD. degree in power electronics from University of Galati, Romania, in 1994.In 1998, he joined Aalborg University, Institute of Energy Technology, power electronics and drives department, Denmark where he currently works as an associate professor teaching power electronics courses for master students and supervising PhD students.

He has more than 80 papers published, 1 book and 3 patents.

He is the co-recipient of the Technical Committee Prize Paper Awards at IEEE IAS Annual Meeting 1998, and Third-ABB Prize Paper Award at IEEE Optim 2002. He is a Senior Member of IEEE and Associate Editor for IEEE Power Electronics Letters.

His areas of interests are: design and control of power converters used in renewable energy systems, distributed generation, computer simulations, digital control implementation.

He is the founder and coordinator of the Green Power Laboratory at Aalborg University focusing on the development and testing of grid converters for renewable energy systems.

Marco Liserre, received the MSc and PhD degree in Electrical Engineering from the Bari Polytechnic, respectively in 1998 and 2002. From January 2004 he is an assistant professor of the Bari Polytechnic teaching courses of basic and advanced power electronics as well as industrial electronics to undergraduate and Msc students.

He has worked towards several project funded by the Italian Minister of Research and by private companies like Ansaldo Breda.

His research interests are in power converters and drives namely in the control of converters, in the power quality and in the distributed generation. He has co-authored more than 70 technical papers, 13 of them in international peer-reviewed journals.

He was visiting Professor at Aalborg University (Denmark) and he has continuously carried out collaboration with the University of L'Aquila. He has lectured at the Aalborg University (Denmark), at Delft University (Netherlands), at Warsaw University of Technology (Poland) and in Raleigh (USA) during the international conference IECON 2005 within the Tutorial "Grid Converters and their Control in Distributed Power Generation Systems".

Marco Liserre is Editor of the Newsletter of the Industrial Electronic Society and Associate Editor of the IEEE Transactions on Industrial Electronics.

Fee

The fee is 9000,- DKK for industrial people and 6000 DKK for PhD students from outside Denmark (free for Danish PhD students). The fee includes coffee, lunch for all three days and copy of slides and articles.

Credits

3.0 ECTS

Registration

Preferably now and no later than October 23, 2006 by email to:
Susanne Hansen, skh@iet.aau.dk

Further information

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Industrial/Ph.D. Course in

Power Electronics for Renewable Energy Systems – in theory and practice

Nov 15-17, 2006

Institute of Energy Technology

Denmark

Background of the course

There is a rapid development in the area of Distributed Power Generation Systems (DPGS) based on Renewable Energy Sources (RES) like Photovoltaics (PV), wind turbines (WT), micro-hydro and fuel-cells. Especially for grid-connected DPGS an exponential growth in terms of installation power can be observed, mainly due to the subventions given by governmental policies around the world for clean “green” electricity production

The objectives of this course are to learn about the design and control, both basic and advanced (linear, non-linear controllers, active damping) of the power electronics converters used in single-phase and three-phase renewable energy systems mainly for photovoltaics and wind turbine systems connected to the utility grid or to a microgrid. Practical issues as the influence of the sensor position on the control and the design of the grid interface filter are addressed with industrial examples.

There will be increased focus on the compliance with the new power-quality standards DGPS that impose stringent requirements in terms of power quality, grid monitoring and islanding.

Control design experience will be gained by using advanced simulation models in Simulink for both single-phase and three-phase grid converters

Hands-on experience will be provided in the state-of-the-art Green Power Laboratory where all the students will do experiments including solar cells characterization, control implementation for single-phase and three-phase grid converters controlled by dSPACE.

Keep yourselves updated at our web pages

http://www.iet.aau.dk/

under Research, under Green Power Converters

Place

Aalborg University
Institute of Energy Technology
Pontoppidanstraede 101, Room 23
DK-9220 Aalborg East
Denmark

Language

English

Prerequisites

A degree in electrical engineering or control engineering. Matlab/Simulink knowledge is strongly recommended.

Literature

M.P. Kazmierkowski, R. Krishnan, F. Blaabjerg.
"Control in Power Electronics".
Academic Press. 2002.
ISBN 0-12-402772-5
http://books.elsevier.com

A number of related articles and copy of slides are includded in the course documentation (included in the fee).

Nov, 15, 2006, 08.30-16.30

L1 Introduction to Renewable Energy Sources. Solar energy potential and economics
L2 Introduction to Photovoltaics. Solar cells technology Electrical characteristics of solar cells. Modelling solar cells
L3 Lab exercise: Solar cells characterization.
L4 PV inverter power configurations. Topologies for dc-dc boost converters. MPPT methods Introduction to the Green Power Laboratory
L5 Lab exercise: MPPT methods –simulation
L6 Lab exercise: MPPT methods – experimentation with DSP-controlled setup.
L7 Control structures for single-phase PV inverters
L8 Grid synchronization and monitoring for single-phase grid converters . PLL techniques.

Nov. 16, 2006, 08.30-16.30

L9 Current control. Linear controllers. Harmonic compensation
L10 Advanced control. Nonlinear controllers. Stability. Active damping.
L11 Lab exercise: Control design of single-phae grid converter – simulation (2 hr)
L12 Lab exercise: Control of single-phae grid converter – experimentation with DSP-controlled setup (2 hr)
L13 Anti-islanding techniques for grid converters. Grid impedance estimation.
L14 Wind energy potential and economics. Power configurations of WT. Wind farms

Nov. 17, 2006, 08.30-16.30

L15 WT-Control. Fixed and variable control. System control. Generator converter control
L16 Grid converter control. Topologies. Modulation techniques. Current control Stand alone mode.
L17 Grid synchronization and monitoring. PLL techniques
L18 Lab exercise: Control design of three-phase grid converter – simulation.
L19 Lab exercise: Control of three-phase grid converters. experimentation with DSP-controlled setup (2 hr)
L20 Wind turbine grid connection requirements.Grid codes. Ride-through capabilities.
L21 Evaluation of lab results. Course evaluation. Closing discussion

Lecturers

Associate Professor, Ph.D. Remus Teodorescu,
Aalborg University, Denmark

Assistant Professor, Ph.D. Marco Liserre
Bari Polytechnic, Bari