MODERN ELECTRICAL MACHINES AND APPLICATIONS
PhD course 8 - 10.10.2012 (3 days)

Organizer: Department of Fundamentals of Electrical Engineering and Electrical Machines
Course Responsible: Prof. Anouar Belahcen
Lecturers: Prof. A. Belahcen (Tallinn University of Technology/Aalto University, Finland)
           Dr. Pia Lindh (Lappeenranta University of Technology, Finland)
Audience: PhD- and advanced Master’s students in the field of Energy, Electrical and Mechanical Engineering
Language: English
Location: Ehitajate tee 5, VII-323, Tallinn
Registration: before October 5, email: toomas.vaimann@ttu.ee

Backgrounds and Objectives
The quasi totality of the worldwide electric energy is produced by electrical machines working as generators in thermal, hydraulic or wind power plants. More than 65% of this energy is consumed by electrical motors in different industry applications. The electrical motor is usually the main energy conversion device in large industrial systems. Understanding the operation principle of different types of electrical machines as well as the way they are controlled and the criteria for choosing one type or the other is primordial in all energy and power engineering applications. The aim of this course is to introduce the students to the applications and to clarify the control and choice criteria as well as to illustrate the advantages and limitations of electrical machines in different applications. The modelling methodologies for electrical machines are also explained.

Participation
The course is free of charges and targeted to postgraduate and advanced Master’s students in electrical, energy, and mechanical engineering; especially those from machines, drives, automation, and energy areas.

Course contents
- Types of Electrical Machines
- Applications of Electrical Machines
- Operation principle of Electrical Machines
- Losses in Electrical Machines
- Modelling of Electrical Machines
- Control of Electrical Motors
- Choice of Electrical Motors
- Choice of Generators

Course Schedule

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<td>9.00 - 10.30</td>
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<td>10.30 - 11.00</td>
<td>Break</td>
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<td>11.00 - 12.30</td>
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<td>13.30 - 15.00</td>
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<td>15.00 - 15.30</td>
<td>Break</td>
<td>Control</td>
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<td>15.30 - 17.00</td>
<td>Group work</td>
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<td>Pia Lindh</td>
<td>Anouar Belahcen</td>
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Pia Lindh
Anouar Belahcen
Pia & Anouar