

## Teaching portfolio

### 1. Teaching CV: A list of any lecturing and supervision tasks, including specification of academic fields, scope, level (bachelor, master, continuing education, PhD) as well as any external examiner tasks.

Bachelor level:

- o Circuit theory and Electrical machines (basic circuit theory, DC and induction machines)
- o Simulation techniques (Z-transformation and Fourier transformation)
- o Measuring techniques (including analog and digital measuring systems, sampling techniques, transducers and uncertainty calculations)
- o Electromagnetism (especially concerning wave propagation and transformer modelling and hysteresis)
- o Power systems (calculation of transmission line parameters and power flow)
- Lecture about smart grids for techno-anthropology

Master level:

- o Microcomputers in measuring techniques (digital measuring systems, sampling, transducers)
- o Sensors and transducers (including modelling using distributed parameters, determination of transfer functions, reconstruction of steps and pulses)
- o Advanced power systems (including power quality issues, FACTS and compensation systems)
- o High voltage techniques (test and high voltage laboratories with AC, DC and lightning impulses, insulation test, partial discharges, over voltage protection)
- Lecture about research in smart grids for techno anthropology

– Ph.D level

- o Smart Distribution Systems
- o Dispersed Generation of Electricity (both in Denmark and Estonia)
- o Building the Bridge between Electrical Grid Control and Communication in Smart Grids

– Summer schools primary bachelor level

- o Power Summer school (Taught together with other power system universities and technical high schools in Denmark from 2010-2012)
- o Future smart grids taught at Aalborg university since 2011(both thermal and electrical aspects, where I taught some of the electrical aspects and is main organizer)

Supervision:

Supervision of project groups at all semester on the bachelor and master level during my 31 years experience with teaching. The supervision on master level have normally been on projects in the power system area and are done in cooperation with industry such as local distribution companies like Himmerlands Electricity Supply (HEF) or SEAS-NVE or together with transmission systems operators like Energinet.dk. But projects have also been done with industry like Danfoss or Vestas, dealing with electrical machines and generators. I have also had projects concerning insulation performance for instance with Bang Olufsen and Bonus Wind turbines.

Supervision of Ph.D students in the power system area in relation to on-going research project, mainly in the smart grid area. So far 20 Ph.D students are finalized and 1 are on-going. Some of the topics have been in the area of modelling of high voltage components such as transformers for televisions and high voltage cables. Other has been dealing with issues concerning wind turbines such as stability issues, integration of large wind penetration in the network grid, reliability and transient behavior. The more recent project have been on distribution level focusing on the future smart and intelligent network structure with demand side management and multienergy systems

### 2. Study administration: A list of any study administration tasks, e.g. study board membership, head of studies or semester or course coordinator, accreditation, etc.

Administrative work in teaching area:

- Head of studies in Energy and vice chair for department head with responsibility for education from October 2018 –
- Head of board of studies of Energy January 2007-oktober 2018
- Member of board of studies of Electronics and information technology from February 1996 until end 2006

### 3. University pedagogy qualifications: A list of any completed courses in university pedagogy, PBL courses, workshops, academic development projects, collegial guidance and supervision, etc.

Courses for teaching activities:

- English for Academic Purposes, Advanced Level, Sept.- Dec. 1991, Aalborg University.
- Educational pedagogic course for assistant professors at Aalborg University 1994/1995. 180 hours.
- Course for chairs of board of studies. Copenhagen Business School/Southern Danish University, autumn 2008

•Course for study leaders, (Uddannelsesledelse ved danske universiteter efteråret 2019) organizer SDU, autumn 2019

#### **4. Other qualifications: Conference attendance, editorials, presentations, etc. relating to education, 'University Teaching Day', etc.**

Has participated in the University teaching day several years

#### **5. Teaching activity development and teaching materials: A list of any contributions to the development of new modules, teaching materials, study programmes, e-learning, collaboration with external business partners, etc.**

I have been co-author on a book chapter

Frequency-Control Reserves and Voltage Support from Electric Vehicles. / Pillai, Jayakrishnan Radhakrishna; Bak-Jensen, Birgitte. Grid Integration of Electric Vehicles in Open Electricity Markets. red. / Qiuwei Wu. Wiley, 2013. s. 178-191.

#### **6. Teaching awards you may have received or been nominated for.**

Type your answer here...

#### **7. Personal reflections and initiatives: Here you may state any personal deliberations as regards teaching and supervision, any wishes and plans for further pedagogic development, plans for following up on feedback/evaluations from students, etc.**

AAs a supervisor and lecturer I would like to be a person who guides the students to gain knowledge and build on their experience in their development throughout their studies. I would like to facilitate them in a challenging and constructive learning environment, taking different learning possibilities into account such as problem based and project oriented learning. Further, when teaching courses, I would also like, that the students are active, participate in discussions and ask questions, taking also new methods such as voting, brain storming, small questionnaires, work groups etc. into consideration. The methods can for instance be ideas learned from different courses and lectures about teaching held at Aalborg University yearly, as the "Teaching day".

To me it is important that the students take responsibility for their own studies; but that we as lecturers are able to support them both during courses and during the supervision on their project work. I think it is very important that the theory given is also supported by practical examples and also that the students gets some hands on experiences during laboratory work or by cooperation with industry, getting real data to use and evaluate during their work. This interaction between theory and practice and dealing with real problems set up by the industry is a very good foundation for the students also later when they leave university for jobs in the industry.

Above is listed the teaching activities I have done during my time at Aalborg University. The main teaching activities for the time being are teaching Ph.D students and Ph.D courses. But most of my teaching obligations and dedication is now more in administrative part of the teaching area, as the Head of studies of Energy and as vice department head for the department of Energy technology, where I have the responsibility for the teaching area. Here I am responsible for changing and updating the study curricula in the Energy area, so they fulfil the demands from our surrounding industry also for the future energy engineers. In addition, quality check and getting the right staff for teaching of our studies are also among the important tasks for this position. This is an ongoing task, and we are just in the middle of changing these curricula both at bachelor and master level here in 2019.

#### **8. Any other information or comments.**

I have been guest lecture at Brasov university two times, one time Krakow university and one time at Warsaw university. Two times guest lecture at Jeju university in South Korea All these activities are mainly done for master level. Besides this I have been teaching a Ph.D course in Dispersed generation of electricity for several years in Tallinn. I have further been a part of a small EU project led by Tallinn University regarding a new study curriculum for their electrical engineers. Finally, I have also been in an assessment committee for a Norwegian curriculum for a new study.