Teaching Portfolio

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Teaching Philosophy

The best teachers I have known have all had one thing in common; they are very passionate about the topic they teach and they have a deep desire to share that knowledge. Through their great enthusiasm, they attract the full attention of their students, and often students want to learn even more about the topic/field. They inspire me and I do my best to learn from them.
In my teaching, I strive to engage and activate the students by encouraging them to reflect on the topic and to ask lots of questions such that my teaching happens in a lively dialogue with the students. Also, questions from students create fine opportunities for repeating essential parts of the topic and maybe provide alternative explanations of phenomena's.
If students can see a clear purpose of a topic, they will be far more motivated to learn it. I always start my teaching by motivating the students for the topic by explaining the significance of it and by giving examples of important real-life use cases of the topic. This is quite easy in my field, since any source of renewable or sustainable energy is heavily dependent on the use of power electronics for harvesting, converting, storing, distributing and consumption of electrical energy.
Also, the course objectives must be made clear to the students from the very beginning. This way the students will have a clear understanding of objectives and expectations and can better relate each course activity to the final objectives.
I make great efforts to ensure that my teaching always starts at a level all students can follow and to prioritize the key topics of the course curriculum. This of course, is intended to help all students to follow my teaching.
In my teaching, I put significant emphasis on providing the students with a good understanding of the key fundamental theory of the topic. It is my experience, that this fundamental understanding of the theory is vital for the students' general understanding of the topic and for their later ability to master it. Problem based teaching is a very good way to achieve this. I always start by thoroughly explaining the theory while using plenty of examples. Right after the theory has been explained, the students will be activated by solving exercises in the same topics. The main purpose of the exercises is to help the students gaining a deeper comprehension of the theory of the topic, but it also serves as a mean of monitoring their general understanding of the topic and for later repetition during the following discussion of the exercises and the theory.
In general, I strive to create an open and active dialogue-based teaching environment, where open discussions and questions inspire students to seek deeper understanding of the topics and to grow their confidence in themselves.
At the end of each lecture, I make small notes about potential needs and opportunities for optimizing my lecture for next semester. Also, at the end of the semester I seek critiques and suggestions from the students for adjustments and improvements of my teaching. I use these notes for optimizing and adjusting my lecture before each lecture. In general, I really like making changes to my lectures from year-to-year, since it also makes my teaching more challenging to me and thus keeps me sharper. The students are generally very happy with my teaching and appreciate my commitment and competence.

Employment

Institute of Mechanical and Electrical Engineering

20. Feb 2025 → 31. Aug 2026

Professor with Special Responsibilities

Centre for Industrial Electronics

Sønderborg
20. Feb 2025 → 31. Aug 2026

Teaching and supervision

With more than 20 years of combined experience in engineering teaching, I am an experienced teacher. I enjoy teaching and thoroughly appreciate the interaction with my students. I find teaching to be a rewarding, honorable and utterly meaningful thing to do. I consistently receive very good feedback and appreciation for my teaching and competence in the field.
I have been teaching from third semester Bachelor level up to 10th semester Master level. In recent years, I have mostly been teaching on the new Master program in Electronics.
I have eight years of teaching experience from my employment at the Technical University of Denmark (August 1993 –

June 2000) and another 15 years of teaching experience at University of Southern Denmark (August 2014 – present). Over the years, I have taught around two lecture courses per year on average, in addition to project supervisions of semester projects and a very large number of supervision of BSc. and MSc. thesis projects. Finally, I have been principal supervisor on 7 completed PhD projects. Presently, I am the principle supervisor for another two ongoing PhD projects. Most of my teaching at SDU has been in English.

Below is a list of my recent teaching:

Power Electronics EK-PWE-U1
1st semester MasterIntroduction to power electronics, operation of switch mode dc-dc converters, modelling and analysis of switch mode dc-dc converters, power semiconductor technologies, three-phase inverters for drive systems. 5 points

Advanced DC-DC Converters EK-ADCC-U1
Advanced dc-dc converter topologies (two-phase, resonant, etc.), power devices, drive- and protection circuits, auxiliary functions (OVP, C/L, UVP, soft start, aux. PS, inrush limitation, etc.), control circuit, input- and output filters, high frequency magnetics design (proximity effect, leakage inductance, parasitic capacitances, magnetic materials, etc.) and practical aspects of converter design.5 points

Project supervision
3rd sem. to MSc. thesisProject supervision of a large number of different projects, ranging from 3rd semester to BSc. Thesis' and MSc. thesis'.5 – 40 points

Power Electronics EFN ET-ENFO-U1
4th semester ENTEKPower electronics for Energy Technology Master students. Applications, power components, converter topologies, analysis of converters, input- and output filters, transfer function, modelling and control, dc-ac inverters and power factor controllers.5 points

Power Electronics and Electric Machinery (XE-PEM)
International exchange program on power electronics and machines (English)
Fundamental power electronics, dc-dc and dc-ac converters.5 points

Control Engineering and Signal Processing (XE-CES)
International exchange programme on control engineering and signal processing (English)
Modeling of dynamic and electrical systems.
- 1st and 2nd order linear systems.
- Laplace transforms.
- Analysis and control of linear systems through mathematical and graphical methods (MatLab/SimuLink). PID control. Stability. Frequency analysis. Poles and Zeros.6 pointsl
Integreret Design – EKK II
4th semesterFundamentals of electrical components and circuits part II. Components, Thermal, EMI, Electrical Safety, Electrical Machines etc.5 points09 - 12Written report

Effektelektronik RED-EFN
3rd SemesterBasic power electronics for power engineers. Switching power poles, Buck, Boost and Buck-boost, Topology selection and PWM control.5 points04 -06

Power Electronics E-EFN1
5th sem. Power Eng.Power electronics: Power components, dc-dc converters, SMPS power supplies, introduction to magnetics design, input- and output filters. 5 point

Research outputs

Soft-switching pulse-width modulated dc-dc power converter
Nymand, M. (Inventor), 30. Dec 2021, IPC No. H02M1/34, H02M3/335, Patent No. WO2021259918 (A1), 30. Dec 2021, Priority date 23. Jun 2020, Priority No. EP20200181543

High Efficiency Power Converter for Low Voltage High Power Applications
Nymand, M., 10. Sept 2010, DTU. 164 p.

High-efficiency isolated boost dc-dc converter for high-power low-voltage fuel-cell applications
Nymand, M. & Andersen, M. A. E., 1. Feb 2010, In: IEEE Transactions on Industrial Electronics. 57, 2, p. 505-514 10 p.

Switch mode pulse width modulated dc-dc converter with multiple power transformers
Nymand, M. (Inventor), 2010, Patent No. PCT/DK2008/000274

A new very-high-efficiency R4 converter for high-power fuel cell applications
Nymand, M. & Andersen, M. A. E., 2009. 5 p.

New primary-parallel boost converter for high-power high-gain applications
Nymand, M. & Andersen, M. A. E., 2009, In: IEEE Applied Power Electronics Conference and Exposition (APEC) Proceedings. p. 35-39 5 p.

Reducing ac-winding losses in high-current high-power inductors
Nymand, M., Madawala, U. K., Andersen, M. A. E., Carsten, B. & Seiersen, O. S., 2009, In: Proceedings of the Annual Conference of the IEEE Industrial Electronics Society. p. 777-781 5 p.

What is the best converter for low voltage fuel cell applications: A buck or boost?
Nymand, M., Tranberg, R., Madsen, M. E., Madawala, U. K. & Andersen, M. A. E., 2009, In: Proceedings of the Annual Conference of the IEEE Industrial Electronics Society. p. 962-970

A new approach to high efficiency in isolated boost converters for high-power low-voltage fuel cell applications
Nymand, M. & Andersen, M. A. E., 2008, *Power Electronics and Motion Control Conference, 2008. EPE-PEMC 2008. 13th* . IEEE, p. 127-131

Teaching and supervision

EMI study of the AC/DC converters

Kouchaki, A.
01/02/2018 → 31/05/2018

Grid Connected PWM Voltage Source Converter

Kouchaki, A.
01/02/2017 → 30/11/2017