

Teaching Portfolio

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Pedagogical view

I am a firm proponent of the inductive learning method, where the teaching is motivated by a practical examples as the very first thing. Thereafter, the students are allowed to think about the example and then one build the theory of the lecture on top of that.

Teaching Experience

I have helped develop teaching material for several courses (strength and materials, constrained optimisation), taught high-level material to high-school students, and been a teaching assistant a multitude of times in many different courses (statics, dynamics, strength and materials, advanced finite element programming, etc.). Furthermore, I have co-supervised a number of thesis students (2 B.Sc. and 2 M.Sc.), as well as a shorter project (15ECTS) and a postdoc.

Teaching:

- Oct.-Dec. 2013 SRP Exercises: Together with Niels Aage (DTU), I developed and performed teaching for students on the subjects of simple beam bending, stresses, and constrained optimisation. The teaching also contained a smaller practical component with additive manufacturing. Carried out over 2 sessions of 2 days for smaller groups of high school students.
- Sep.-Dec. 2013 Teaching assistant (extended role): As a teaching assistant in the advanced finite element programming course at DTU, I assisted a large number of groups weekly with comprehension and programming. Furthermore, I marked the first set of reports for the entire class and gave a lecture on the common mistakes and correct approaches.
- Aug.-Sep. 2013 Videnskaben på besøg: Together with Niels Aage (DTU), I developed an hour long interactive introduction to topology optimisation. The presentation made use of simple examples coupled with an interactive smartphone app to teach high school students about structural optimisation. I taught a large group of high school students at Allerød Gymnasium.
- 2008-2014 Teaching assistant: I have acted as a teaching assistant for a wide array of courses during my studies and Ph.D. degree: Mechanics (four times), Introductory Strength of Materials (two times), Dynamics, Advanced Strength of Materials, Programming the Finite Element Method (FEM Heavy), and the DCAMM Ph.D. course on Topology Optimization: Theory, Methods and Applications. Being a teaching assistant has given me the invaluable skill of being able to convey knowledge to newcomers in several different ways. As each student has a different way of thinking and understanding, it is important to be able to see things from their perspective and explain the advanced subject matter based on their background knowledge. Furthermore, by helping others to understand a subject, I have gained an extended insight into these subjects and now have them completely under control.

Supervision:

- Aug. 2019 - current Daniel Nørhave and Lukas C. Høghøj (M.Sc.): "Topology optimization of heat exchangers" with Casper S. Andreasen and Ole Sigmund (DTU).
- Feb.-Jun. 2019 David Ajit Kirpekar-Sauer (B.Sc.): "Optimization of cooling fins" with Anton Evgrafov (DTU).
- Aug. 2018 - Feb. 2019 Lasse Boehm (M.Sc.): "Numerical analysis and experimental investigations of flat sheet ceramic membranes" with Niels Aage (DTU).
- Feb.-Nov. 2018 Nicolo Pollini (Postdoc): "Simplified models for high resolution three-dimensional topology optimization" with Ole Sigmund (DTU).
- Sep. 2016 - Jan. 2017 Janus Asmussen (15ECTS special course): "Topology optimization for transport processes" with Casper S. Andreasen and Ole Sigmund (DTU).
- Feb.-Jun. 2015 Brit S. Nissen (B.Sc.): "Natural convection for LEDs" with Boyan S. Lazarov, Knud Erik Meyer and Niels Aage (DTU).
- Sep. 2014 - Feb. 2015 Christian Lundgaard (M.Sc.): "Topology optimization of fluid-structure-interaction problems" with Casper S. Andreasen and Ole Sigmund (DTU).

Formal pedagogical training

I have completed the introductory course in university teaching at the Technical University of Denmark (DTU): UDTU Module 1 - Teaching and Learning (2.5ECTS).

Nov. 2013 UDTU Module 1 - Teaching and Learning (2.5ECTS)

Other activities related to teaching and teaching development

Jan. 2014 - Apr. 2015 Elected member of the Ph.D. Committee for the "Construction, Production, Civil and Transport Engineering" Ph.D. school at DTU.

Jan.-Dec. 2012 Elected student member of the studyboard at the Department of Mechanical Engineering (MEK) at DTU.