

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 motivational example 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. This ensures that the students know why they are learning the theory and what it can be used for. The aim is to ensure their enthusiasm through the potentially tough theory that will be covered.

Furthermore, I integrate certain aspects of the "flipped learning" concept. The above, introducing a motivational example and subsequent thinking in groups, is an example of "peer instruction". After my pedagogical development project, I have also taken a liking to an "inverted classroom"-type shift of activities from inside the classroom to outside the classroom. More specifically, shifting lecture material to preparatory videos, has been successful in allowing more time for active learning during face-to-face time through examples, exercises and discussions.

Research-based Teaching

I use a lot of examples from my research to motivate the students at the beginning of a course. For "Structural Optimisation", I use my past and current work to illustrate what the methods covered by the course has the potential to be used for. Furthermore, in "Heat Transfer" I have incorporated experimental test data from my research into the first lecture to show the students how convection coefficients can be approximated using experimental data.

Teaching Experience

Teaching:

Feb. 2022 - current	Multiphysics Simulation and Optimisation: Elective course for M.Sc. in Mechanical Engineering and 'Physics and Technology'. Spring semester, 4 lectures and project supervision.
Feb. 2022 - current	Heat Transfer: Part of the "Advance Fluid Dynamics and Heat Transfer" course for 1st semester M.Sc. in Mechanical Engineering. Spring semester, 7 lectures.
Feb. 2022 - current	Heat transfer: Part of the "IFG4" module for the 4th semester B.Eng. in Mechanical Engineering. Spring semester, 8 lessons. Theory as well as lab exercise.
Feb. 2021 - current	Full responsibilities for the "Structural Optimisation:Theory and Applications" course for 2nd semester M.Sc. in Mechanical Engineering. Autumn semester (except F21 first time), 12 lessons, 5ECTS.
Feb. 2020-Jun. 2021	Conjugate Heat Transfer: Part of the "Advanced Fluid Dynamics and Heat Transfer" course for 1st semester M.Sc. in Mechanical Engineering. Spring semester, 2 lessons.
Feb. 2020-Jun. 2020:	Finite Element Analysis: Part of the "Project Theme 4" module for 4th semester B.Eng. in Mechanical Engineering. Spring semester, 7 lessons.
Sep. 2019-Jan. 2020	Dynamics: Part of the "Technical Design 3" module for 3rd semester B.Eng. in Integrated Design. Autumn semester, 7 lessons.
Oct.-Dec. 2013	SRP Exercises: Teaching for high school students on the subjects of simple beam bending, stresses, and constrained optimisation. Together with Niels Aage (DTU).
Aug.-Sep. 2013	Videnskaben på besøg: Interactive introduction to topology optimisation using simple examples and an interactive smartphone app to teach high school students about structural optimisation. Together with Niels Aage (DTU).
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.

Supervision:

Supervision of a number of students at various levels:

Main supervisor: 6 x B.Eng., 5 x M.Sc. (1 present)

Co-supervisor: 1 x B.Eng., 2 x B.Sc., 4 x M.Sc., 1x Ph.D. (1 current), 1 x Postdoc

Visiting students: 1 x Ph.D. (1 current)

External: 5 x M.Sc. (1 present), 1 x Ph.D. (1 present)

Formal pedagogical training

Jan. 2020 - Nov. 2021: Lecturer Training Program (10ECTS). Extensive course in university pedagogics and teaching at the University of Southern Denmark (SDU)

Sep. 2020 - Dec. 2020: Pedagogical Development Project: More time for active learning by shifting lectures to preparatory videos.

Nov. 2013: UDTU Module 1 - Teaching and Learning (2.5ECTS). Introductory course in university teaching at the Technical University of Denmark (DTU).

Other activities related to teaching and teaching development

Mar. 2021 - current: Elected member and vice-chairman of the Department Council for the Department of Mechanical and Electrical Engineering at the University of Southern Denmark (SDU).

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.