

## 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.

#### **B.Sc. and M.Sc. Courses lectured at Aalborg University:**

Composite Structures, 1 ECTS, M-Tech, 2009.  
Composite Materials for Wind Turbine Rotor Blades, 2 ECTS, Department of Civil Engineering, 2009.  
Theory of Elasticity and Finite Element Methods, 3 ECTS, M-Tech, 2010.  
Finite Element Methods, 5 ECTS, M-Tech, 2010.  
Numerical Modelling, 5 ECTS, Department of Health Science and Technology, 2011.  
Finite Element Methods, 1 ECTS, Department of Architecture, Design and Media Technology, 2011.  
Theory of Elasticity and Finite Element Methods, 3 ECTS, M-Tech, 2011.  
Finite Element Methods, 5 ECTS, M-Tech, 2011.  
Fracture Mechanics, 5 ECTS, M-Tech, 2011.  
Theory of Elasticity and Finite Element Methods, 5 ECTS, M-Tech, 2012.  
Numerical Modelling, 5 ECTS, Department of Health Science and Technology, 2012.  
Finite Element Methods, 5 ECTS, M-Tech, 2012.  
Fracture Mechanics, 5 ECTS, M-Tech, 2012.  
Constructing the detail, 5 ECTS, Department of Architecture, Design and Media Technology, 2012.  
Theory of Elasticity and Finite Element Methods, 5 ECTS, M-Tech, 2013.  
Numerical Modelling, 5 ECTS, Department of Health Science and Technology, 2013.  
Teknisk og numerisk analyse, 5 ECTS, Department of Architecture, Design and Media Technology, 2013.  
Finite Element Methods, 5 ECTS, M-Tech, 2013.  
Fracture Mechanics, 5 ECTS, M-Tech, 2013.  
Theory of Elasticity and Finite Element Methods, 5 ECTS, M-Tech, 2014.  
Numerical Modelling, 5 ECTS, Department of Health Science and Technology, 2014.  
Teknisk og numerisk analyse, 5 ECTS, Department of Architecture, Design and Media Technology, 2014.  
Finite Element Methods, 5 ECTS, M-Tech, 2014.  
Fracture Mechanics, 5 ECTS, M-Tech, 2014.  
Theory of Finite Element Methods and Continuum Mechanics, 5 ECTS, M-Tech, 2015.  
Teknisk og numerisk analyse, 5 ECTS, Department of Architecture, Design and Media Technology, 2015.  
Finite Element Methods, 5 ECTS, M-Tech, 2015.  
Fracture Mechanics and Fatigue, 5 ECTS, M-Tech, 2015.  
Theory of Finite Element Methods and Continuum Mechanics, 5 ECTS, M-Tech, 2016.  
Styrkelære og anvendt FEM, 5 ECTS, Department of Architecture, Design and Media Technology, 2016.  
Maskinelementer, analyse og dimensionering, 5 ECTS, Department of Architecture, Design and Media Technology, 2016.  
Finite Element Methods, 5 ECTS, M-Tech, 2016.  
Fracture Mechanics and Fatigue, 5 ECTS, M-Tech, 2016.  
Theory of Finite Element Methods and Continuum Mechanics, 5 ECTS, M-Tech, 2017.  
Finite Element Methods, 5 ECTS, M-Tech, 2017.  
Fracture Mechanics and Fatigue, 5 ECTS, M-Tech, 2017.  
INTRO course DMS1, 5 ECTS, MP, 2017.  
Theory of Finite Element Methods and Continuum Mechanics, 5 ECTS, MP, 2018.  
Finite Element Methods, 5 ECTS, MP, 2018.  
Fracture Mechanics and Fatigue, 5 ECTS, MP, 2018.  
INTRO course DMS1, 5 ECTS, MP, 2018.  
Theory of Elasticity and Finite Elements, 5 ECTS, MP, 2019.  
Finite Element Methods, 5 ECTS MP, 2019.  
Fracture Mechanics and Fatigue, 5 ECTS, MP, 2019.  
Theory of Elasticity and Finite Elements, 5 ECTS, MP, 2020.  
Finite Element Methods, 5 ECTS MP, 2020.  
Fracture Mechanics and Fatigue, 5 ECTS, MP, 2020.

#### **Supervised B.Sc. and M.Sc. student groups at Aalborg University:** (Abbreviations: Design of Mechanical Systems - DMS, Maskin og Produktion -MP)

Windmaster 3rd, 3(3) students(groups), 2009.  
DMS 1st (MSc), 6(1) students(groups), 2010.  
DMS 3rd (BSc), 2(1) students(groups), 2010.  
DMS 4th (MSc), 2(1) students(groups), 2011.  
DMS 1st (MSc), 5(1) students(groups), 2011.  
DMS 3rd (MSc), 4(2) students(groups), 2011.  
DMS 4th (MSc), 5(2) students(groups), 2012.  
DMS 3rd (MSc), 1(1) students(groups), 2012.

DMS 1st (MSc), 5(1) students(groups), 2012.  
 DMS 4th (MSc), 3(1) students(groups), 2013.  
 DMS 1st (MSc), 5(1) students(groups), 2013.  
 MP 6th (BSc), 5(1) students(groups), 2014.  
 DMS 2nd (MSc), 5(1) students(groups), 2014.  
 DMS 4th (MSc), 1(1) students(groups), 2014.  
 DMS 1st (MSc), 5(1) students(groups), 2014.  
 DMS 1st (MSc), 5(1) students(groups), 2015.  
 DMS 3rd (MSc), 1(1) students(groups), 2015.  
 DMS 4th (MSc), 2(1) students(groups), 2016.  
 DMS 1st (MSc), 4(1) students(groups), 2016.  
 DMS 3rd (MSc), 2(1) students(groups), 2016.  
 DMS 4th (MSc), 2(1) students(groups), 2017.  
 DMS 4th (MSc), 2(1) students(groups), MP, 2017.  
 DMS 1st (MSc), 6(1) students(groups), MP, 2017.  
 DMS 3rd (MSc), 4(2) students(groups), MP, 2018.  
 DMS 4th (MSc), 2(1) students(groups), MP, 2019.  
 DMS 3rd (MSc), 3(1) students(groups), MP, 2019.  
 DMS 4th (MSc), 3(1) students(groups), MP, 2020.  
 DMS 3rd (MSc), 1(1) students(groups), MP, 2020.

#### **PhD Courses lectured at Aalborg University:**

Analysis and Design Optimization of Laminated Composite Structures, 5 ECTS, M-Tech, 2012.  
 Fracture Mechanics for Laminated Composite Structures, 4 ECTS, M-Tech, 2012.  
 Analysis and Design Optimization of Laminated Composite Structures, 5 ECTS, M-Tech, 2014.  
 Fracture Mechanics for Laminated Composite Structures, 5 ECTS, M-Tech, 2015.  
 Analysis and Gradient Based Optimization of Laminated Composite Structures, 5 ECTS, M-Tech, 2016.  
 Fracture Mechanics for Laminated Composite Structures, 5 ECTS, M-Tech, 2017.  
 Analysis and Gradient Based Optimization of Laminated Composite Structures, 5 ECTS, MP, 2018.  
 Analysis and Gradient Based Optimization of Laminated Composite Structures, 5 ECTS, MP, 2020.

**PhD and Postdoc supervision:** Formerly advisor for 5 PhD students. Currently advisor for 4 PhD students and 2 Postdocs.  
 2011-2014 Brian Bak (PhD): Progressive Damage Simulation of Laminates in Wind Turbine Blades under Quasistatic and Cyclic Loading (industrial Ph.D. project, Siemens Wind Power A/S, co-supervisor with Prof. Erik Lund, AAU, and Prof. Bent F. Sørensen, DTU.)

2012-2015 Søren Randrup Henriksen (PhD): Optimum Design of Laminated Composite Structures for Robot-Based Manufacturing (co-supervisor with Prof. Erik Lund, AAU).

2013-2017 Esben Tøke Christensen (PhD): Optimal Design of Flexible Mould (co-supervised by Prof. Erik Lund, AAU).

2015-2018 Jens Jakob Bender (PhD): Fatigue Strength Prediction of Composite Wind Turbine Blade Substructures with Scaling Effects.

2015-2017 Laura Carreras (PhD): Development of efficient testing methods and cohesive zone models for analyzing fatigue-driven delamination in 3D laminated composite structures (External co-advisor together with Jordi Renart (University of Girona, Spain), Albert Turon (University of Girona, Spain), and Brian L.V. Bak (AAU)).

2018-2021 Simon Mosbjerg Jensen (PhD): Fatigue-driven Delamination of Laminated Composite Structures (co-supervised by Assoc. Prof. Brian L.V. Bak, AAU).

2018-2021 Guillem Gall Trabal (PhD): Fatigue-driven Damage in Laminated Composite Structures (co-supervised by Assoc. Prof. Brian L.V. Bak, AAU).

2018-2021 Jens Jakob Bender (Postdoc): Postdoc in the AAU Talent program project "Fatigue-driven Damage in Laminated Composite Structures" (co-supervised by Assoc. Prof. Brian L.V. Bak, AAU).

2018-2022 Laura Carreras (Postdoc): Postdoc in the EU H2020 project "Understanding of the Physics of Wind Turbine and Rotor Dynamics through an Integrated Simulation Framework" (UPWARDS) (co-supervised by Assoc. Prof. Brian L.V. Bak, AAU).

2020-2023 Asbjørn Malthé Olesen (PhD): Characterization and development of failure criteria for static/fatigue failure in preform transitions (co-supervised by Assoc. Prof. Brian L.V. Bak, AAU).

2020-2023 Peter Hede Broberg: The effect of defects on the strength of preform transitions in wind turbine blades (cosupervisor with Assoc. Prof. Brian L.V. Bak, AAU).

#### **PhD evaluation committees:**

Moderator of 6 PhD defences at M-Tech, AAU. 2013 (1), 2015(3), 2017 (1), 2019 (1).

Chairman and member of the assessment committee concerning Saeed Davaudabadi Farahani's PhD project defended November 2014 at Department of Mechanical Engineering, Aalborg University.

Chairman and member of the assessment committee concerning Peng Wang's PhD project defended April 2016 at Department of Mechanical Engineering, Aalborg University.

Member of the assessment committee concerning Philipp Ulrich Haselbach's PhD project defended February 2016 at Department of Wind Energy, Technical University of Denmark.

Member of the assessment committee concerning Reidar Kvale Jøki's PhD project defended June 2016 at Department of Mathematics, University of Oslo.

Member of the assessment committee concerning Johannes Främby's PhD project defended December 2019 at Department of Industrial and Materials Science, Chalmers University of Technology.

**Other teaching activities:**

Invited lecturer at M.Sc. course in Nonlinear Finite Element Methods, 5 ECTS, Department of Mechanical Engineering and Industrial Construction, University of Girona, Spain, 2015.

Examiner of FEM B.Sc. course at VIA University College, Horsens, Denmark, 2011, 2013, 2014.

Examiner of student B.Sc. and M.Sc. theses at Aarhus University, School of Engineering, Aarhus, Denmark, 2013.

Examiner of advanced FEM M.Sc. course at Aarhus University, School of Engineering, Aarhus, Denmark, 2014.

Examiner of M.Sc. course on Mechanics of Composite Materials at Aarhus University, School of Engineering, Aarhus, Denmark, 2018, 2019.

Examiner of numerous student theses at the Department of Mechanical and Manufacturing Engineering, Aalborg University.

**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.**

Semester coordinator of the entire Masters programme (all semesters) (M.Sc. Curricula) "Design of Mechanical Systems", Industry and Global Business Development (M) Study Board, AAU (2014-2018). Course coordinator and co-coordinator for the courses: Styrkelære og anvendt FEM (B.Sc.), Theory of Finite Element Methods and Continuum Mechanics (M.Sc.), Finite Element Methods (M.Sc.), Fracture Mechanics for Laminated Composite Structures (Ph.D.). Principal organizer for increasing the enrolment of international students on the M.Sc. program "Design of Mechanical Systems" (DMS) and planning of a special introductory course and semester project for international students on 1st semester on DMS (2016). Coordinator for a revision of the M.Sc. curricula for the Masters programme "Design of Mechanical Systems" in 2016 – approved 2017.

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

Completed the AAU pedagogical course for assistant professors in the period 2010-2013.

Attended several workshops, meetings, and lectures organized by AAU on PBL, moodle, teaching pedagogy, study programmes, semester planning, course planning, etc.

Passed the "Pasteur Program 2013", leadership program given by the Harvard Business School, Boston, USA. (Management course funded by the Danish National Advanced Technology Foundation), 2013.

Passed the "Research Management Course 2019", given by the Copenhagen Business School Executive.

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

Lecturer and informant at "Ph.D. as career direction 2008, 2009, 2010, 2013, 2015", held for the Master students at Department of Mechanical and Manufacturing Engineering, AAU.

Conference attendance, editorials and presentations see <https://vbn.aau.dk/da/persons/116424/publications/>

**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.**

Coordinator for the establishment of collaboration between studies at Tech College Aalborg and studies at AAU concerning laminated composite structures, 2016.

Organizer for a complete revision of three fundamental courses on The Finite Element Method in 2016. The courses are provided on the B.Sc. and M.Sc. study programmes: Maskin og Produktion (B.Sc.), Sports Science (M.Sc.), and Industrial Design (B.Sc.). The courses were completely revised and aligned sharing a dominant part of the content in order to follow a strategy in which the research group becomes less vulnerable in providing teaching. I taught two out of three courses in 2016.

Principal organizer for increasing the enrolment of international students on the M.Sc. program "Design of Mechanical Systems" (DMS) and planning of a special introductory course and semester project for international students on 1st semester on DMS (2016).

Coordinator for a revision of the M.Sc. curricula for the Masters programme "Design of Mechanical Systems" in 2016 – approved 2017.

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

Nominated and selected as the "Teacher of the Year 2014" by the study board for Industry and Global Business Development (M).

The course on "Styrkelære og anvendt FEM" taught under the study board of architecture and design was ranked as the best activity on the 6th semester at the study programme Industrial Design in 2016.

One of five nominees for "Teacher of the Year 2019" at the study board of Materials and Production. Elected by the students.

**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.**

In general, I receive very positive feedback for my courses and supervision, so at the moment I have no plans for major updates of the courses.

In my teaching, I constantly pursue new opportunities to increase student involvement and reflections in order to reach higher learning. Some of the tools and techniques that I work with are: student self-evaluating questions, student presentation of exercises, layout of oral exam, student answers to quick questions by lottery, small lecture room exercises, workshops, course mini projects.

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