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**Faculty of Engineering Science and Technology  
Department of Marine Technology**

# PhD position in computational modeling of fracture in thin-walled structures.

Fracture mechanics is a crucial method for the assessment of the safety of many marine structures, such as ships, tanks, pipelines, wind turbines, platforms, etc. Over the last decades, different models have been developed for the numerical simulation and prediction of fracture processes with finite element methods. Among these, the so-called phase field approach has recently gained a lot of popularity since it can describe both crack initiation and propagation, even until total failure of the structure, and it can track complex crack patterns including branching and merging of cracks. While this approach is well studied for solid mechanics, dedicated research is needed for its application to structural models like plates and shells, which are essential components of marine structures.

The aim of this work is to develop and implement numerical methods (finite element and/or isogeometric methods) to model fracture in thin-walled structures like plates and shells, and their application to marine structures. Aspects of special focus will include the interaction of fracture and buckling phenomena and the extension to fiber composite materials, as well as the validation with experimental results. A specific target application could be found in offshore wind turbines, performing detailed studies both for the tower and the turbine blades.

The research work takes place in the Marine Structures group at the Department of Marine Technology, Faculty of Engineering Science and Technology at the Norwegian University of Science and Technology (NTNU). The Marine Structures group is a leading international research unit with a strong discipline basis and with application to systems for production of oil and gas, renewable ocean energy, aquaculture and deep sea minerals extraction. The group is the host of research centers of excellence: Centre for Ships and Ocean Structures and Centre for Autonomous Systems and Operations. The PhD position will be associated with these centers.

The applicant is expected to have a civil-, ocean- or mechanical engineering background with knowledge in finite element (or isogeometric) methods and structural mechanics, possibly also in nonlinear mechanics, as well as programming experience.

For further information please contact Assoc. Prof. Josef Kiendl ([josef.kiendl@ntnu.no](mailto:josef.kiendl@ntnu.no)), tel.: +49 531 94360.

## **Conditions of appointment:**

PhD candidates are remunerated in code 1017, grade 50-57 on the Norwegian State salary scale, gross NOK 416 300 to NOK 468 100 per year (before tax). PhD students are normally remunerated at wage level 50. There will be a 2 % deduction to the Norwegian Public Service Pension Fund from gross wage.

The fellowship is awarded for 3 years. If the PhD fellow takes on teaching responsibilities for the Department for 25% of his/her total work load, the fellowship will be prolonged by one additional year.

Engagement as a PhD Candidate is done in accordance with "Regulation concerning terms and conditions of employment for the posts of post-doctoral research fellow, research fellow, research assistant and resident", given by the Ministry of Education and Research of 19.07.2010. The goal of each of the announced positions is to obtain a PhD degree. Applicants will engage in an organized PhD training program, and appointment requires approval of the applicants plan for a PhD study within three months from the date of commencement. See <http://www.ntnu.edu/ivt/phd> for more information.

The engagement is to be made in accordance with the regulations in force concerning State Employees and Civil Servants. The positions adhere to the Norwegian Government's policy of balanced ethnicity, age and gender. Persons with immigrant background and women are encouraged to apply.

According to the new Freedom of Information Act, information concerning the applicant may be made public even if the applicant has requested not to be included in the list of applicants.

The application including a CV, grade transcripts (courses with grades) from the undergraduate as well as graduate studies, and other enclosures should be sent electronically via the link on this page (apply for this job). Mark your application with ref.no IVT-72/16.

**Application deadline: 10.06.2016**

Jobbnorge ID: 124853, Deadline: Closed