Jobbnorge ID: 279013
Deadline: 4/29/2025
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Temporary

The Department of Structural Engineering has a vacancy for a

PhD Candidate on ductility requirements of Timber Connections

This is NTNU

NTNU is a broad-based university with a technical-scientific profile and a focus in professional education. The university is located in three cities with headquarters in Trondheim.

At NTNU, 9,000 employees and 43,000 students work to create knowledge for a better world.

You will find more information about working at NTNU and the application process here.

Video: https://youtu.be/Xt-yHCN5QS0

About the position

We have a vacancy for a Ph.D. Candidate within the timber structures' group at the Department of Structural Engineering.

The timber structures group at NTNU has had a great development over the last years. The research interests of the group are focused on development of structural concepts for mid-rise timber buildings, timber bridges with long spans, development of high-performance connections based on threaded rods, static and dynamic testing of timber components and investigation of fracture and high-cycle fatigue. The research methods are based on both small-scale and full-scale experimental testing and on Finite Element Modelling.

Are you motivated to take a step towards a doctorate and open up exciting career opportunities? As a PhD Candidate with us, you will work to achieve your doctorate, and at the same time gain valuable experience that qualifies you for a further career in higher education and research, in and outside academia.

About the project

The proposed research aims to optimize the design of timber building systems with innovative connections and achieve an extended service-life. Over the last decade, the timber structures group at NTNU has developed an innovative connection technology consisting of threaded rods, patented metallic brackets and pre-stressed bolts inserted in oversized holes. The developed connections have shown very high stiffness and resistance, and they feature damage-free ductility as they dissipate energy by friction instead of yielding. The connections are also highly reversible which is the key element for Design for Assembly/Disassembly and Reassembly (DfADR) which enhances circularity of structural components and enables replacement of damaged components due to time-dependent and moisture effects, extreme loading, or even unforeseen reasons. The ductility of connections can be controlled by over-sizing the holes. Ductile connections have significant potential to:

- mitigate redistribution of actions, due to long-term loading and moisture changes over time
- reduce uncertainties of actions due to material/connection stiffness variability
- for high seismic resilience
- for achieving increased structural robustness

The project will build on past and ongoing national and international projects that have focused on stiffness and resistance connection requirements and explore the ductility requirements of connections to achieve high performance of timber buildings with respect to all aspects mentioned above. This task will be carried out by use of parametric Finite Element simulations (e.g. pushover analysis and/or incremental dynamic analysis). Moreover, the project aims to verify the ductility requirements with full-scale experimental results and explore possibilities for improving the performance of the connections, aiming at: reliable friction properties, oversizing of holes to achieve the desired ductility and preventing brittle modes by use of capacity design principles.

The Ph.D. project aims to start in August/September 2025. The Ph.D. position holder will be required to work in Trondheim, together with the rest of the timber structures group.

Your immediate leader will be the supervising professor.

Duties of the position

- Completing the doctoral education (including courses for a minimum of 30 credits)
- Carrying out research of high-quality within the project framework
- Publishing academic papers and contributing to scientific dissemination
- Participating in international activities and networking (e.g. conferences)
- Carrying out review of existing literature
- Carrying out Parametric Finite element simulations by use of programming
- Carrying out Experimental testing

Be prepared for changes to your work duties after employment.

Required selection criteria

- You must have an academically relevant background within Structural Engineering.
- You must have a Master's degree in Structural Engineering or equivalent. Your course of study must correspond to a five-year Norwegian program, where 120 credits have been obtained at master's level. Master's students can apply, but the master's degree must be obtained and documented before starting the position.
- You must have a strong academic background from your previous studies and an average grade from the master's degree program, or equivalent education, which is equal to B or better compared with NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic basis. If you have a weaker grade background, you may be assessed if you can document that you are particularly suitable for a PhD education.
- You must meet the requirements for admission to the faculty's doctoral program
- You must have good written and oral English language skills.

The appointment is to be made in accordance with Regulations for the Universities and Colleges Act (university and colleges regulations) and Regulations for the degrees philosophiae doctor (ph.d.) and philosophiae doctor (ph.d.) in artistic development work at the Norwegian University of Science and Technology (NTNU) for general criteria for the position.

Preferred selection criteria

- Suitable background (M.Sc. degree or equivalent) within structural engineering and/or timber engineering.
- Experience in scientific timber-related laboratory work
- Knowledge of Finite Element software programs (e.g. Abaqus and OpenSees or similar)
- Programming skills (e.g. Matlab, Python or similar).
- Knowledge of European standards for the design of buildings (Eurocodes)
- Ability to handle big datasets
- Oral and written presentation skills in Norwegian or another Scandinavian language is a merit

Personal characteristics

To complete a doctoral degree (PhD), it is important that you:

- are highly motivated and diligent
- are able to work both independently and as part of a group.
- are able to work in a structured way, set goals and make plans to achieve them
- have good communication skills in scientific writing and oral presentations.
- show curiosity and a strong motivation for the subject

Emphasis will be placed on personal qualities.

We offer

- An exciting job with an important mission in society
- Developing tasks in a strong and international professional environment
- Career guidance and follow-up during the PhD period
- Open and inclusive working environment with committed colleagues
- Mentor programme as a new employee at NTNU
- As a public employee, you have favourable benefits as a member of the Norwegian Public Service Pension Fund (SPK)

You will be employed as a PhD Candidate at NTNU and will have access to employee benefits and discounts.

Diversity

Diversity is a strength, and at NTNU we aim to be an employer that reflects the diversity in society and that makes use of the potential of the population's collective skills. Our vision is Knowledge for a better world and our values are creative, critical, constructive and respectful. We believe that an organization that is equal, diverse and gender-balanced is essential for us to achieve our goals.

We strive to attract employees with different skills, life experiences and perspectives to contribute to even better problem solving of our societal mission in research and education.

If you think this position is relevant and interesting, we encourage you to apply, regardless of gender, functional ability and cultural background, or whether you have been out of work for a period of time.

At NTNU we want to increase the proportion of women in scientific positions. We have a number of measures to promote equality.

Salary and conditions

In the position of PhD Candidate, code 1017, your gross salary will normally be NOK 536 200,- per annum depending on qualifications In the position of PhD Candidate, code 1017, your gross salary will normally be NOK 536 200,- per annum depending on qualifications and seniority. A 2% statutory contribution to the State Pension Fund is deducted from the salary.

The employment period is 3 years (a **4**-year period with 25 % career promotion work may be considered).

For employment as a PhD Candidate, it is a prerequisite that you gain admission to the PhD programme in Engineering within three months of your employment contract start date, and that you participate in an organized doctoral programme throughout the period of employment.

As an employee at NTNU, it is important that you keep yourself up to date with academic and organizational changes and adapt to them.

For the necessary academic and social interaction, it is a prerequisite that you are physically present and available to the institution on a daily basis.

The appointment is carried out in accordance with the principles of the State Employees Act, and Export control (legislation that regulates the export of knowledge, technology and services). Candidates who, after assessment of the application and attachments, are considered to be in conflict with the criteria in the latter act, will not be able to be employed.

About the application

The attachments (including a description of your scientific work) must accompany the application as these documents form the basis of the application assessment. The documents must be in Norwegian/a Scandinavian language or English.

Please note: the application will only be assessed on the basis of the information we have received by the application deadline. Therefore, make sure that your application clearly shows how your skills and experience meet the criteria described above. The application and all attachments must be sent electronically via Jobbnorge.no. If you are invited to an interview, you must bring certified copies of certificates The application must include:

- Transcripts and diplomas for Bachelor's and Master's degrees
- CV
- Copy of Master's thesis. If you have recently submitted your Master's thesis, you can attach a draft of the thesis. Documentation of a completed Master's degree must be presented before taking up the position.
- Short letter of motivation
- Possibly publications etc. other relevant research work
- Possibly certificates
- Names and contact information of three relevant referees

If all, or parts, of your education has been taken abroad, we also ask you to attach documentation of the scope and quality of your entire education, both Bachelor's and Master's education, in addition to other higher education. If your institution uses “diploma supplement” (normal for most European institutions), you must attach this. A description of the documentation required can also be found here. If you already have a statement from Norwegian Directorate for Higher Education and Skills (HK-dir), please attach this as well.

Joint works will be considered. If it is difficult to identify your contribution to joint work, you must attach a brief description of your participation.

When assessing the best qualified, we emphasize necessary qualifications such as education, experience and personal suitability. Motivation for the position, ambitions and potential for research will also count when assessing the candidates.

NTNU recognizes a wide range of academic contributions and has committed itself to The San Francisco Declaration on Research Assessment and CoARA (responsible assessment of research and recognition of a greater breadth of academic contributions in accordance with NTNU's social mission).

General information

A public list of applicants with name, age, job title and municipality of residence is prepared after the application deadline. If you wish to be exempt from entry on the public applicant list, this must be justified. Assessment will be made in accordance with current legislation. You will be notified if the exemption is not granted.

If you think this position looks interesting and in line with your qualifications, you are welcome to apply.

If you have any questions about the position, please contact Associate Professor Haris Stamatopoulos, e-mail: haris.stamatopoulos@ntnu.no. If you have any questions about the recruitment process, please contact Kristine Grønvold, e-mail: kristine.gronvold@ntnu.no.

Application deadline: 29.04.2025

For practical information about working at NTNU, please visit this webpage.

The city of Trondheim is a modern European city with a rich cultural scene. Trondheim is the tech capital of Norway with a population of 200,000. The Norwegian welfare state, including healthcare, schools, kindergartens and overall equality, is probably the best of its kind in the world. Professional subsidized day-care for children is easily available. Furthermore, Trondheim offers great opportunities for education (including international schools) and possibilities to enjoy nature, culture and family life and has low crime rates and clean air quality.

NTNU - knowledge for a better world

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The Norwegian University of Science and Technology (NTNU) creates knowledge for a better world and solutions that can change everyday life.

Department of Structural Engineering

We teach mechanical engineering, engineering and ICT, and civil and environmental engineering. The Department conducts internationally leading research and participates in several large national research projects. The Department of Structural Engineering is one of eight departments in the Faculty of Engineering.

Additional information

Place of service:

Høgskoleringen 1 7491 Trondheim (Trondheim Municipality)