

**Jobbnorge ID:** 287813  
**Deadline:** 10/31/2025  
**Website:** <http://www.ntnu.no>  
**Scope:** Fulltime  
**Duration:** Temporary

The Department of Manufacturing and Civil Engineering has a vacancy for a

## **PhD Candidate in Next Gen. Decarbonized Concrete Engineered with Biogenic and Pozzolanic Materials**

### **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**

The PhD project will focus on the development of innovative cementitious composites with a low carbon footprint, emphasizing the use of biogenic materials and silica-based pozzolanic materials as partial substitutes for traditional binders and fillers. The research addresses one of the most pressing challenges in the construction industry, reducing greenhouse gas emissions associated with cement production, while maintaining or improving the performance of cementitious systems. The project will concentrate on high matrix volume compositions, which are especially suitable for contexts such as self-compacting concrete and additive manufacturing (3D printing), enabling new design opportunities and advanced construction techniques.

The research methodology combines theoretical modelling and experimental validation. The work will begin with an extensive review of existing literature, standards, and material databases to establish predictive models for sustainable cementitious mixes. These models will integrate performance criteria (e.g., strength, durability, workability) with sustainability metrics, such as carbon footprint and energy use. Based on these models, selected material formulations will be developed and tested in the laboratory. Experimental investigations will include material characterization, mechanical performance testing, rheological behavior, and durability assessments, with the goal of verifying and refining the predictive models.

In the later stages of the project, building elements such as timber-concrete composite floor slabs and 3D-printed wall elements will be produced using the most promising sustainable mixes. These prototypes will be tested to evaluate mechanical and durability performance under realistic conditions. The findings will be used to calibrate finite element simulations, which will serve as a tool to predict material and structural behavior across scales. Finally, the project will integrate the technical results with life cycle assessment (LCA), thereby linking material composition, structural performance, and environmental impact into a holistic predictive framework for sustainable construction materials.

The outcome of the research is expected to contribute not only to the academic knowledge base but also to the development of next-generation sustainable building solutions aligned with the global climate agenda.

Your immediate leader will be the Group leader.

### **Duties of the position**

- Complete the doctoral education until obtaining a doctorate.
- Conduct a comprehensive review of existing literature and data gathering to develop prediction models for sustainable cementitious mixes.
- Carry out experimental investigations of selected materials and processes to achieve desired performance.
- Characterize and model material properties, including environmental impact assessment.
- Document processes and outcomes in patent applications, scientific publications, and project reports.
- Complete the mandatory PhD coursework (30 ECTS).
- Contribute actively to the academic environment at the department, faculty, and NTNU.
- Report research progress regularly in collaboration with supervisors.

Be prepared for changes to your work duties after employment.

## Required selection criteria

- You must have a relevant Master's degree in civil engineering, mechanical engineering, chemical engineering or equivalent in related fields. Your course of study must correspond to a five-year Norwegian course, where 120 credits have been obtained at master's level.
- You must have a strong academic background from your previous studies and have an average grade from your Master's degree study, or equivalent education, which is equal to B or better compared to [NTNU's grading scale](#). If you do not have letter grades from previous studies, you must have an equally good academic foundation. If you have a weaker grade background, you may be considered 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 Programme ([link](#))
- Excellent written and spoken English skills.

PLEASE NOTE: For detailed information about what the application must contain, see paragraph "About the application".

The appointment is to be made in accordance with [NTNUs guidelines for recruitment positions](#) 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

- Peer-reviewed publications in relevant fields.
- Experience with modelling and simulation, e.g. machine learning, parametric design, or finite element tools (Abaqus, Ansys, etc.).
- Relevant experimental research or practical experience in sustainable building materials.

## Personal characteristics

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

- Work independently with strong initiative and enthusiasm for research.
- Work in a structured way, set goals and make plans to achieve them
- Present and discuss your research with other professionals
- Get involved and contribute constructively with feedback
- Work constructively under pressure or in the face of adversity
- Be flexible and open to adjusting the plan for the project as needed

Emphasis will be placed on personal qualities.

## We offer

Evaluate and remove/add what is relevant for the position.

- 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
- [Working capital](#) that can be used to implement the project
- [Mentor programme](#) as a [new employee at NTNU](#)
- Favorable terms as a member of the [Norwegian Public Service Pension Fund \(SPK\)](#)
- Free Norwegian language training at a basic level ([A2](#)).

As a PhD Candidate at NTNU, you will have access to [employee benefits](#).

## 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 550 800,-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.

For employment as a PhD Candidate, it is a prerequisite that you gain admission to the PhD programme in Engineering [Doctoral Programme - PhD - Faculty of Engineering Science - NTNU](#) within three months of your employment contract start date, and that you participate in an organized doctoral programme through out 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 professional 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 and diplomas upon request.

The application must include:

- Transcripts and diplomas for Bachelor's and Master's degrees
- CV
- Project outline containing proposals for an overall description of research questions, theoretical perspectives, methodological design for the project and progress plan (maximum 1500 words/4 pages)
- Short letter of motivation (400 words/1 page)
- 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 work 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 Mohammad H. Baghban, +47 61135217, [Mohammad.baghban@ntnu.no](mailto:Mohammad.baghban@ntnu.no).

If you have any questions about the recruitment process, please contact Kristine Rognlid Hagaseth, [kristine.r.hagaseth@ntnu.no](mailto:kristine.r.hagaseth@ntnu.no)

### Application deadline: 31.10.2025

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For practical information about [working at NTNU](#), please visit [this webpage](#).

**Gjøvik**, a charming town by the shores of Lake Mjøsa, is known for its beautiful nature and rich cultural offerings. The town boasts a vibrant community with excellent schools, modern healthcare services, and a variety of recreational activities. With its strategic location, just a short drive from Oslo, Gjøvik combines the best of urban life and natural experiences. Here, you'll find a dynamic business environment and exciting career opportunities in a setting that values work-life balance.

## NTNU - knowledge for a better world

### NTNU - knowledge for a better world

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

## **Department of Manufacturing and Civil Engineering**

Our profile of expertise can help to solve the world's most important societal challenge: the development of sustainable solutions in industry and society. This profile includes research on modern industrial processes, use of new and recycled materials, new technological solutions and the application of new forms of organization and business models. The [Department of Manufacturing and Civil Engineering](#) is one of eight departments in the [Faculty of Engineering](#).

## **Additional information**

### **Place of service:**

Teknologivegen 22 2815 Gjøvik (Gjøvik Municipality)