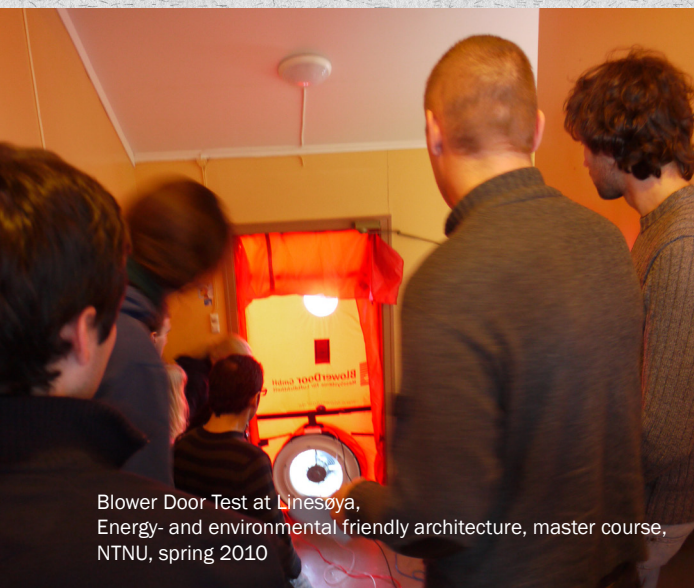


ENTRY QUALIFICATIONS

A 3-year Bachelor Degree in Architecture, Engineering or Urban Planning. Students with a background in other relevant fields may be considered for admission as well, after discussion with the MSc coordinator and Advisory Board.
English Language Requirements: TOEFL Score 500/170; IELTS mark 5.0

CAREER PROSPECTS

The M.Sc. programme in Sustainable Architecture lies in the forefront of research, innovation and implementation related to reducing GHG emissions in architecture which the students will be able to transfer into their practice as building professionals. The continuous focus on integrated design methodology will enable the students to perform in any building design team, both as co-worker and leader.



Blower Door Test at Linesøya, Energy- and environmental friendly architecture, master course, NTNU, spring 2010



NTNU – Trondheim
Norwegian University of
Science and Technology

ZEB

The Research Centre on Zero Emission Buildings



**Towards a zero emission
built environment -**

Sustainable Architecture, MSc

**Master of Science postgraduate - MSc,
Two year programme**

[www.ntnu.no/studies/
sustainablearchitecture](http://www.ntnu.no/studies/sustainablearchitecture)

Annemie.Wyckmans@ntnu.no

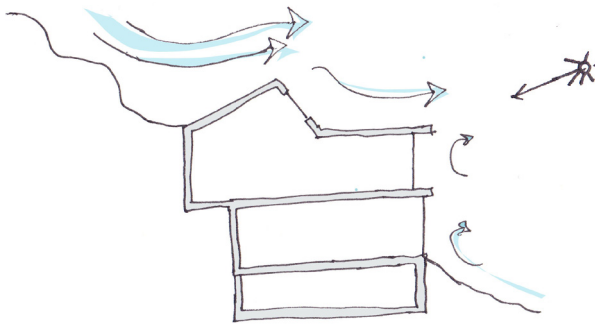
Semester 1: Climate and built form

Concepts and strategies related to energy efficient, sustainable and zero emission buildings and built environment (theory 7.5 credits)

- > Terminology, principles and challenges related to sustainable architecture; a broad scope of issues ranging from insight in the history of sustainable architecture to a discussion of the most up-to-date concepts of zero-emission buildings and built environment.
- > Levels ranging from building to community and urban areas are discussed, including an introduction to issues such as land use, green infrastructure, traffic, and urban storm-water management and the corresponding challenges and strategies related to mitigation and adaptation to climate change and resource scarcity.
- > Policy and economic challenges posed by innovative building strategies in society.

Climate and built form
(project 15 credits + theory 7.5 credits)

- > Project design related to the resources and limitations posed by local site conditions, indoor and outdoor climate; to analyse local site and climate and their consequences for built form, along with an in-depth study of building physics and human comfort requirements.
- > Different building shapes, functional programmes and site types are addressed, with focus on indoor as well as outdoor areas.
- > Importance of daylight, solar access and shading, ventilation, heating and cooling heating strategies, wind and precipitation.



"Centre for recuperation and rest" - climate adaptation sketches. Master Thesis in Architecture, NTNU 2010, Anne Solbraa

Semester 2: Integrated Energy Design

Integrated energy design (project 15 credits);
Energy systems and services and their integration in architectural design (theory 7.5 credits)

- > Building systems and services and their integration in architecture to provide a good indoor climate in a resource-efficient manner.
- > Interdisciplinary procedures necessary to ensure a successful functioning of these systems in architecture.
- > Integrated design methodology, evaluation tools and user behaviour
- > Challenges related to the renovation of existing buildings and cultural heritage sites.
- > Project design with focus on integrated energy design and interdisciplinary co-operation between building professionals. Projects addressing domestic and non-domestic buildings, as well as new and existing building structures.

Sustainable building materials and components
(theory 7.5 credits)

- > Building materials, construction and detailing, ranging from vernacular building materials to innovative nano-materials,
- > Environmental labelling and consequences on GHG emissions during the building's life cycle.
- > Specify construction materials in a brief, compare materials' performance using different criteria, critically analyse product information. evaluate materials' effect on user health and indoor climate.



"Campushotel - short exercise". Collaboration project between engineering and architect students. Energy- and environmental friendly architecture, master course, spring 2007, NTNU. Andrea Poll, Finn Volla Karlsen, Håvard Houen, Kristian Hegde Kluge, Kristina Noren, Trond Fossen.

Semester 3: Zero emission building

Design of zero emission buildings (project 15 credits);
Use and operation of zero emission buildings (theory 7.5 credits);

- > Project design that integrates strategies for energy, emissions, materials and users into high-quality architecture.
- > Environmental management, planning and procurement of the construction site and building project, as well as user participation in the design and operation of low-energy architecture.
- > Evaluation criteria of environmental classification tools, along with specific quality control and documentation methodology.
- > Contracting alternatives and their effect on the overall environmental and economic performance of the project.

Elective Course (theory 7.5 credits)

- > To be chosen in dialogue with teaching staff, at other faculties at NTNU or another educational institution, in order to prepare the student in the best possible manner for their thesis work.
- > May for example be related to environmental policy, economics, project management, or user participation.

Semester 4: The M.Sc. Thesis

- > During the final semester of the curriculum, the students work on their thesis project, based on their individual professional interest and the elective course they have taken earlier. The scope and topic of the thesis is adapted to the particular professional background of each of the students.



"Passivehouse Linesøya". Student project spring 2010, Energy- and environmental friendly architecture, master course, NTNU.

Ingrid T. Helleve, Elisabeth Langrusten, Truls Y. Kannelønning