

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Lada Leidmane
Student number	5844088

Studio		
Name / Theme	Technologies & Aesthetics	
Main mentor	Geert Coumans	Architecture
Second mentor	Claudia van Leest	Building Technology
Argumentation of choice of the studio	Technologies & Aesthetics Studio offers a platform for exploring individual interests within the overarching realms of materiality, sustainability, and the interplay between water and architecture. The requirement of the studio to envision a design situated in the Rietdiep area a century from now presents a compelling challenge. I believe that the studio provides a delicate balance of freedom for creativity and necessary limitations to develop a meaningful graduation project.	

Graduation project	
Title of the graduation project	Designing with Weather
Goal	
Location:	Lauwersmeer National Park
The posed problem,	Exploiting the dynamic relationship between climate and unpainted timber facades, aiming to transform the perspective towards wood weathering from a potential threat to a strategic and aesthetically valuable design element. This involves understanding the effects of environmental factors on wood, optimizing its response to weathering, and creating a design that evolves gracefully over time.
research questions and	How can unpainted timber-clad buildings be strategically designed to embrace and utilise the weathering process in response

	to the climate and local environment of the Lauwersmeer area?
design assignment in which these result.	Design a building that incorporates untreated timber cladding, leveraging the dynamic relationship with climate to transform wood weathering into an aesthetically valuable design element. In the context of designing an ornithology research centre situated on the border of Lauwersmeer National Park, the aim of the project is to explore the interplay of functionality, aesthetics and climate responsiveness. Moreover, the material-driven design strategy provides the opportunity to explore possibilities of recording the passing of time through the weathering and ageing of unpainted wooden facades.

Process

Method description

Due to the general division of the graduation project into the research stage and design stage, a different set of methods needs to be employed.

The research “Weathering of Untreated Timber Facades in the North Netherlands” sets a base for the overall “Designing with weather” project. The study conducted during the first semester investigates the impact of weathering on untreated timber facades in the context of the Netherlands. The study aims to shift the perception of wood weathering from a negative to a positive aspect by understanding and leveraging its aesthetic and architectural benefits. The research focuses on contextualizing existing experimental and case study findings from Nordic countries to the North Netherlands’ climate. The methodology involves a thorough analysis of weather conditions, specifically in Lauwersoog and Groningen regions, through weather maps. The climate studies then are used to translate the existing knowledge into the local context. The study aims to identify key factors influencing timber weathering, including wood type, cladding design, in-situ weather conditions, and exposure time, with the ultimate goal of informing design strategies for timber buildings in the North Netherlands.

Building upon the knowledge gained in the research stage, the design phase will transition to a more hands-on approach. Utilizing the knowledge acquired about weathering effects on untreated timber facades, the design process will unfold through a combination of drawings and physical models in varying scales. These practical methodologies aim to materialize and embody the conceptual understanding developed during the research phase.

Literature and general practical references

Fajer, T. (2022). *Wood facades: undertaking weathering* (Master's thesis). Retrieved from <http://urn.fi/URN:NBN:fi:aalto-202206264227>

Franck, K. A. (Ed.) (2016). *Architecture Timed: Designing with Time in Mind*. John Wiley and Sons.

Herzog, T., Natterer, J., Schweitzer, R., Volz, M., & Winter, W. (2004). *Timber construction manual*. München, Birkhäuser.

Hirche, M. (2014). *Wood weathering as Design Option* (Thesis for the degree of Philosophiae Doctor). Retrieved from <http://hdl.handle.net/11250/275604>

Pallasmaa, J. (2016). Inhabiting Time. In K. A. Franck (Ed.), *Architecture Timed: Designing with Time in Mind*. (pp. 50-59) John Wiley and Sons.

Royal Netherlands Meteorological Institute. (2015), *KNMI '14 Climate Scenarios for the Netherlands*, Ministry of Infrastructure and Environment.

Rowell, R. M. (Ed.) (1984a). *The Chemistry of Solid Wood*. American Chemical Society.

Rowell, R. M. (Ed.) (1984b). *Handbook of Wood Chemistry and Wood Composites*. CRC Press

Rüther, P. (2011). *Wood Weathering from a Service Life Perspective* (Thesis for the degree of Philosophiae Doctor). Retrieved from <http://hdl.handle.net/11250/231991>

Zimmer, K., Flindal, O., Gobakken, L. R., & Nygaard, M. (2020). *Weathering of unpainted wooden facades - Experience and examples* (Report Wood Be Better, 6(5)). Norwegian Institute of Bioeconomy Research.

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

The graduation project, "Designing with weather," investigating the aesthetic benefits of weathering on untreated timber facades in the North Netherlands, aligns seamlessly with the studio topic, which explores the intersection of technical design innovations and the architectural implications of climate change. Both the project and studio share a common focus on climate-driven design, innovative materials, and sustainable architectural language. This thematic resonance extends to the master track in Architecture, where the emphasis on advanced architectural concepts,

including climate-responsive design and material innovation, complements the studio and graduation project themes. As part of the Master of Science program, the graduation project also underscores a scientific approach to understanding and utilizing weathering effects, harmonizing with the broader scientific goals of the program.

1. What is the relevance of your graduation work in the larger social, professional and scientific framework?

The graduation project holds significant relevance within the broader context of societal, professional, and scientific frameworks. By concentrating on weathering as a deliberate design element, the project directly contributes to the studio's overarching goal of examining the interplay between technical design innovations and the consequences of climate change on architectural aesthetics. Beyond the academic realm, the project addresses climate-related challenges in architectural design, presenting innovative strategies for architects to respond to the impacts of climate change, thus contributing to the ongoing discourse on environmentally conscious architecture. This relevance extends professionally as architects can draw inspiration from the project's findings for sustainable and resilient design solutions. Scientifically, the project enriches the understanding of how climate influences both the aesthetic and functional aspects of architectural elements, providing valuable insights to the broader scientific community and enhancing the knowledge base of the Master of Science program. The interdisciplinary nature of the project, integrating architectural and scientific perspectives, exemplifies the program's commitment to a holistic and research-driven approach to architectural design.