

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	Maddi Gomez Iradi
Student number	6072097

Studio		
Name / Theme	Explorelab	
Main mentor	Roel van de Pas	Architecture
Second mentor	Rufus van den Ban	Building Technology
Argumentation of choice of the studio	Topic of interest not covered in any other studio.	

Graduation project	
Title of the graduation project	Growing architecture
Goal	
Location:	Jakarta, Indonesia (Tropical monsoon climate)
The posed problem,	Baubotanik is a new and experimental building approach. The viability and design applications of Baubotanik have not been explored much in architecture or the urban context.
research questions and	1. What can Baubotanik do? 2. What are the spatial requirements in a typical building?
design assignment in which these result.	To design of a public library using the Baubotanik approach where suitable. In an urban context. In a tropical climate.
<p>The goal of the research project is to determine suitable ways and spaces in which to implement Baubotanik. From a design perspective, this informs the choice of location on a global scale, a suitable programme and the tree species to be used as the primary structure. On a building scale, the research informs what parts of the</p>	

building or programme are compatible with Baubotanik and where to consider conventional construction techniques instead.

The aim of the design project is to design a medium-scale public library in Jakarta using the Baubotanik approach where suitable. Exploring aspects such as time, growth, evolving spatial qualities and outdoor-indoor relationships will be crucial during the design process, with long-term and processual thinking playing an important role. The design will favour a hybrid structure in which living elements and technical elements are combined, offering more design and spatial possibilities and resulting in an interesting interplay between dynamic and static elements.

Process

Method description

The research project analyses existing Baubotanik precedents on the one hand, and spatial requirements across a number of typical buildings on the other. This will be conducted across two different climatic zones (tropical and temperate), in order to observe similarities and/or differences in results.

The design project will be conducted in a research-by-design manner. Additionally, and parallel to that, research will be conducted in the following areas:

- site analysis and survey (history, vegetation, soil, demographics, wider urban context, urban dynamics)
- precedent analysis on libraries
- precedent analysis on passive design
- vernacular architecture
- local building regulations
- materiality

Literature and general practical references

Literature:

Botany Brisbane (2022) 'Ficus growth forms'. Available at:

<https://www.botanybrisbane.com/plants/moraceae/ficus/ficus-growth-forms/>

(Accessed: 22 May 2025).

Bureau Baubotanik (no date) *Projects*. Available at: <https://www.bureau-baubotanik.de/projekte> (Accessed: 22 May 2025).

CABI (no date) 'Ficus microcarpa (Indian laurel tree)', *CABI Compendium*. Available at: <https://www.cabidigitallibrary.org/doi/full/10.1079/cabicompendium.24130> (Accessed: 22 May 2025).

Kalberer, M. and Remann, M. (2003) *Grüne Kathedralen: Die weltweite Wirkung wachsender Weiden*. Aarau: AT Verlag.

Ludwig, F. (2023) *Growing architecture*. Birkhäuser.

Ludwig, F., Middleton, W., Gallenmüller, F. et al. (2019) 'Living bridges using aerial roots of *Ficus elastica* – an interdisciplinary perspective', *Scientific Reports*, 9, 12226. Available at: <https://doi.org/10.1038/s41598-019-48652-w>

National Geographic (no date) 'Köppen-Geiger Climate Classification System Atlas', *Mapmaker*. Available at: <https://www.arcgis.com/apps/instant/atlas/index.html?appid=...> (Accessed: 22 May 2025).

Office for Living Architecture (no date) *Projects*. Available at: <https://www.o-l-a.eu/home/> (Accessed: 22 May 2025).

Piesik, S. (2023) *Habitat: Vernacular architecture for a changing planet*. London: Thames & Hudson.

Precedents:

- Baubotanik Footbridge, Germany
- Waldkirchen Bird Watching Station, Germany
- Baubotanik Tower, Germany
- Stevenraue Platform, Germany
- Plan Tree Cube, Germany
- Arbor Kitchen, Germany
- Living root bridge (Wah Koh La), India
- The Great Banyan, India
- Sri Nambunayaki Amman Temple, India

- Anping Tree House, Taiwan
- Kam Tin Tree House, Hong Kong, China
- Stone Wall Trees, Hong Kong, China

Site visits to:

- Baubotanik Footbridge, Germany
- Baubotanik Tower, Germany
- Plane Tree Cube, Germany
- Arbor Kitchen, Germany

Reflection

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

By undertaking my graduation project with the Explorelab studio and being able to research a topic I am deeply interested in (Baubotanik), I am presented with the freedom to pursue unconventional ideas and test the boundaries of what architecture is and what it could be, by operating freely across a variety of specialisations (architecture, landscape, structural design, environmental design, urban design, ...).

The focus of the graduation is indeed Architecture, but this project will inevitably borrow and integrate knowledge from many related fields. The flexible nature of both the Architecture track and the Master's programme allows me to pursue the interdisciplinary nature of the project topic, in order to come up with a contextually driven architectural intervention and to create integrated solutions for the built environment.

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

From a scientific/academic perspective, considering the so far heavy emphasis on the structural and technical side of the research, there is still much to investigate in the spatial, temporal and climatic aspects of Baubotanik. In this respect, my graduation project hopes to contribute to the existing pool of knowledge by offering some new insights. In particular, it aims to identify suitable ways and spaces in which to implement Baubotanik in design projects, and presents these findings in the form of advice for designers in order to facilitate its application in future projects.

Not surprisingly, given the lack of knowledge, uncertainties it presents as a building material, time-constraints and regulatory grey-zones, the field of Baubotanik has not yet reached the professional field. Perhaps in our current fast-paced urban

environment, the issue of time-constraint might be the biggest hurdle to overcome. The design project hopes to address this aspect by proposing alternative ways to deal with this. Nevertheless, efforts to introduce such structures in the urban context are actively being made in Germany and the much needed exposure will help raise awareness about these alternative construction methods and the potentials of living materials amongst professionals, scientists, academics and the public alike.