

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Personal information	
Name	Tsung-Han Ou
Student number	5942942

Studio		
Name / Theme	Architectural Engineering Studio	
Main mentor	Mo Smit	Architectural Engineering + Technology – Department Building Design & Technology
Second mentor	Eric van den Ham	Architecture Engineering + Technology – Environmental & Climate Design
Argumentation of choice of the studio	I believe that building technologies and detailing should be active driving forces in the process of architectural design, and therefore I chose aE studio as an ideal environment to pursue the study of such subject.	

Graduation project	
Title of the graduation project	Taiwan Renewal Handbook
Goal	
Location:	Taipei City, Taiwan
The posed problem,	Taiwanese cities are experiencing increasingly more frequent extreme heat due to global warming and urban heat island effect. While various building regulations are in place to promote more sustainable and energy-efficient buildings, neither its specific criteria nor the architectural practice culture in Taiwan encourages adoption and/or experimentation of innovative sustainable building approaches.
research questions and	Research question: What are the climatic/cultural/practical challenges Taiwan's architectural sector faces?
design assignment in which these result.	Design question: How can we develop architectural solutions for the adaptive reuse of an old apartment building that are easy to implement and maintain within the opportunities & constraints of Taiwan's architectural context?
Process	
Method description	
The research aims to uncover challenges regarding devising and implementing new sustainable building solutions in Taiwan. The topic is explored from the climatic, practical, and cultural angle.	

The research process consists of software simulation and analysis of the building environment's climatic properties, literature study and interview to understand the tendencies and obstacles in Taiwan's architectural practice, and the documentation/mapping of the physical and habitual living conditions in a typical Taiwanese apartment.

As a follow-up to the thematic research, the design project utilizes the findings of the research as the design guidelines. The process will be split into two phases:

1. General design: The case study, experiment, and categorizing of existing and/or new technical building solutions that emphasizes the simplicity of execution on a practical level. The output is an inventory of low-tech, passive detailing/spatial design schemes tailored for Taiwan's physical and cultural context.
2. Integrated design: The application of said building solutions onto a partial renovation and reuse design for an old Taiwanese apartment building, which helps facilitate user comfort in private and public spaces, and activate the community within the neighborhood.

Literature and general practical references

National Development Council (Taiwan). (2022). Phased Goals and Actions Toward Net-Zero Transition.

Ministry of the Interior (Taiwan). (2017). 內政統計通報 [Ministry of the Interior statistical bulletin], 2017, Week 49.

Chen, Q.-R. (2022). 新建集合住宅導入近零能源建築技術之推動策略研究 [The research on the promotion strategies of near-zero energy building technology adoption in new multi-dwelling housing projects]. Architecture Research Brief, 117. Architecture and Building Research Institute, Ministry of the Interior (Taiwan).

Tzonis, A., & Lefaivre, L. (2001). Tropical critical regionalism: Introductory comments. In A. Tzonis, B. Stagno, & L. Lefaivre (Eds.), *Tropical architecture: Critical regionalism in the age of globalization* (pp. 1–13). Academy Press.

Stagno, B. (2001). Tropicality. In A. Tzonis, B. Stagno, & L. Lefaivre (Eds.), *Tropical architecture: Critical regionalism in the age of globalization* (pp. 65–92). Academy Press.

Lin, S.-L. (2006). The experiences of climatic and environmental modification on colonial architecture during the Japanese period (Doctoral dissertation, National Cheng Kung University, Department of Architecture). ND LTD Taiwan.

Hu, T.-N. (2010). 疏離的現代建築腳本下：台灣附加物的生成與演變 [The conception and evolution of Taiwanese building additions within the detached script of

modern Taiwanese architecture] (Master' s thesis, National Tsing Hua University). NDLTD Taiwan.

Ministry of Interior (Taiwan). (2021). Building Technical Regulations: Chapter 17.

Wang, R. -J. et al. (2023). Green Building Evaluation Manual – Basic Version. Architecture and Building Research Institute Ministry of Affairs, R.O.C. (Taiwan).

TCCIP. (2024). Extreme High Temperatures and Impacts in Taiwan under Global Warming: Taiwan Climate Change Analysis Series Report 2024. Central Weather Administration (Taiwan) et al.

Hwang, R.-L., Lin, C.-Y., & Huang, K.-T. (2017). Spatial and temporal analysis of urban heat island and global warming on residential thermal comfort and cooling energy in Taiwan. *Energy and Buildings*, 152, 804-812.

Hulley, M. E. (2012). The urban heat island effect: Causes and potential solutions. In F. Zeman (Ed.), *Metropolitan sustainability* (pp. 79–110). Woodhead Publishing Limited.

In addition to the research references, building project case studies will also be required during the design process.