Graduation Plan

1. Personal Information

Elya Ouroumova
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2. Studio

Architectural Engineering
Harvest
Design Mentor: Mo Smith
Research Mentor: Nicco Tillie
BT Mentor: Paddy Tomesen
Argumentation for choice of the studio This studio offers the opportunity to gain a deep understanding of circulatory design principles and their application to architectural design. By focusing on nature-inclusive design solutions, involving stakeholders in the development process, and taking a holistic approach to design, it offers a unique and valuable learning experience that will prepare me for the challenges of sustainable design in the future.

3. Graduation Project

Title: Harvesting Technical and Biological Nutrients on Site
Location: Amsterdam, Haverland
Problem Statement
The growth of urban populations has led to an increase in the demand for resources such as food, water, and energy, resulting in the depletion of natural resources and an increase in waste and greenhouse gas emissions. Cities are responsible for 75% of global energy consumption and 80% of greenhouse gas emissions. The incorporation of sustainability criteria and new design principles in urban growth is a challenge of the twenty-first century. The current city model has a linear flow of resources, with imported unrenewable resources and exporting emissions and waste. The linear model of food flow to cities results in high energy consumption and waste and CO2 emissions per food unit. Agriculture contributes one-quarter of annual greenhouse gas emissions, and the global food system needs to greatly reduce its climate impact.

Research Question
How can a synergy of biomimetic and biophilic approaches resiliently integrate food production in the city towards regenerative sustainability?

Research Product
Research that results in sustainable design strategies for the integration of urban agriculture holistically into the city and into the buildings.

Design Assignment
The project will develop a prototype for a sustainable neighborhood that holistically integrates sustainable practices of farming into its design and function. The neighborhood will demonstrate climate-sensitive design with integrated circular practices.

4. Process

Method Description
I will use a continuously repeating process of problem-framing, solution-making, and solution-testing. I will use a lot of sketches to visualize and test the ideas in my mind. At every stage, the best-concluded solutions will be further developed and tested with 3D software and calculations. Starting with defining the problem statement I will focus on, I will tackle the common problem in architecture and design of having vague and not defined problems. Then I will focus on the limited selection of constraints that come from defining the problem of my focus. Based on this, I will make assumptions and solutions that I will continuously test against the problem as I understand it up to that point. Then the original solution will be readjusted continuously as I deepen my understanding of the problem with the development of the design and research.

The project will integrate many types of knowledge, and thus I will repeat this process again and again throughout the projects for different sub-problems and any additional constraints until I develop a satisfactory solution.

5. Future literature for research and design

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Cooper, R., & Burton, E. (2014). Wellbeing and the environmental implications for design. In Wellbeing and the environment (Vol. 2, pp. 653–668). West Sussex, England: John Wiley & Sons Inc.

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Horn, E. and Proksch, G., 2022. Symbiotic and Regenerative Sustainability Frameworks: Moving Towards Circular City Implementation. *Frontiers in Built Environment*, 7.

Stojanovic, M., 2017. Biomimicry in Agriculture: Is the Ecological System-Design Model the Future Agricultural Paradigm?. *Journal of Agricultural and Environmental Ethics*, 32(5-6), pp.789-804.

Blanco, E., Pedersen Zari, M., Raskin, K. and Clergeau, P., 2021. Urban Ecosystem-Level Biomimicry and Regenerative Design: Linking Ecosystem Functioning and Urban Built Environments. *Sustainability*, 13(1), p.404.

Pedersen Zari, M. and Hecht, K., 2020. Biomimicry for Regenerative Built Environments: Mapping Design Strategies for Producing Ecosystem Services. *Biomimetics*, 5(2), p.18.

6. Time Planning

Phase 1: Research and Analysis

Week 1-2: Thematic research and site analyses
- Identify the theme of the project and the relevant topics for research
- Conduct preliminary research through online resources and academic databases
- Identify and read relevant academic articles or publications on the chosen theme

Week 3-4: Situational research and draft research
- Conduct a site visit and observe the surroundings
- Document the site's physical and social characteristics through photographs, sketches, and notes
- Conduct research on the site's history, context, and urban fabric
- Research climate and ecology of the context
- Analyze the site's opportunities and constraints through a SWOT analysis

Week 5-6: Urban draft/master plan and program of requirements and
- Conduct a preliminary analysis of case studies related to the chosen theme
- Identify and document at least 5 case studies in a report or presentation
- Analyze and compare the case studies to draw relevant conclusions and insights
- Identify the specific goals and objectives of the project

Week 7-8: Research finalization
- Draw conclusions from research
- Finish illustrative visuals
- Check and refine the paper

Week 9-10: Draft design (site plans, urban sections,) 1:500 / 1:200
- Develop a preliminary program of requirements based on research
- Apply research findings to draft design

Phase 2: Design Development (After P2)

Week 11-12: Refinement of design

Week 13-14: Work on Building scale

Week 15-16: Work on Building scale

Week 17-18: Detail development

Week 19-20: Finalization of drawings and set up details

Week 21-22: Presentation Preparation

Phase 3: Finalization and Presentation (After P4)

Week 23-24: Apply feedback from P4

Week 25-26: Presentation Preparation