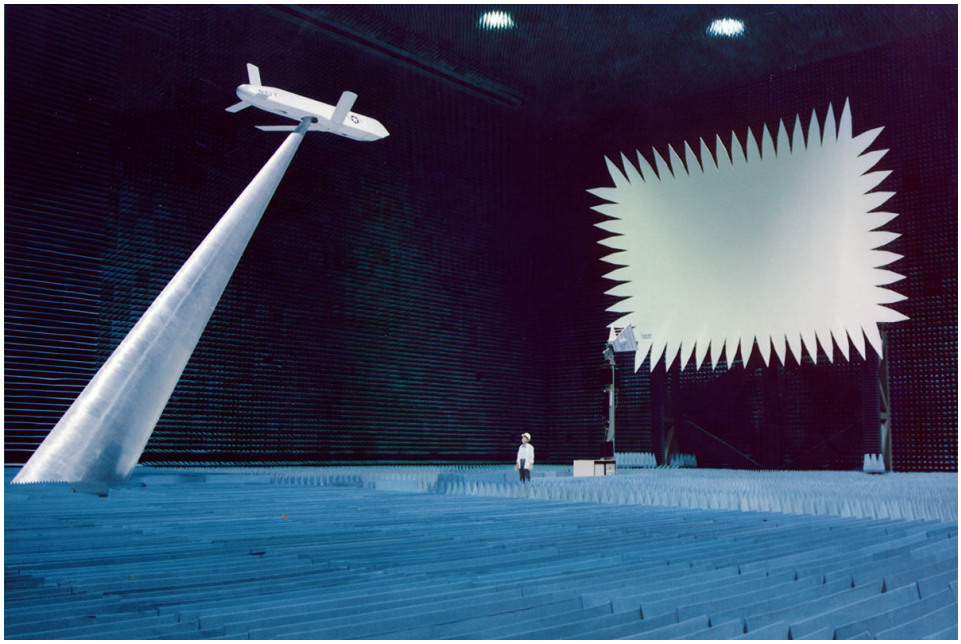
Aalto University
School of Arts, Design and Architecture
Department of Architecture
Building Design
ARK-E2013 Building Design Studio (12 cr)

Fall 2021, September 14th–December 15th

Building Design Studio 2021

Introduction



Radar Cross Section Test Range. Photograph © NSI-MI Technologies

The Fall 2021 Building Design Studio calls for designs for a radio research center in Oulu, Finland. The studio is organized in collaboration with the City of Oulu. The design brief is based on a real-life scenario.

The studio will begin with an analysis of the building site(s) and program, and end with the submission and review of comprehensive design proposals. The coursework can be submitted individually or in groups of two. The workload and submission requirements will be adjusted accordingly.

The studio is as a blended course combining online and on-campus sessions.

The studio runs in parallel with the lecture course ARK-E2006. The lecture course is a mandatory requirement for participation in the studio.

Design Brief

Building Site

The project has two alternative sites in Oulu, Finland:

- Linnanmaa 564-78-3-3 (zoning scheme no. 1863)
- Ritaharju 564-79-29-2/3/5 (zoning scheme no. 1761)

Both sites are located near the Linnanmaa Campus of the University of Oulu and the future radio research center and manufacturing facility of the Finnish telecommunications and information technology company Nokia.

Base map and zoning schemes are attached.

Building Program

The building program comprises research laboratories, offices, and common spaces with a total floor area of approximately 40 000 m² (GFA). The offices will be built in phases.

The project aims to attract several mid-sized companies with 50–250 employees, as well as small companies, start-ups, and research groups. Once finished, the site will house 1 500–2 000 employees and researchers.

Due to the significant cost of high-frequency radio research and testing equipment, the project will require both public funding and support from major private enterprises, such as Nokia. Key considerations for cost reduction are standardized construction, modularity, flexibility, and co-working. Regardless of common premises, each company and research group must be able to maintain confidentiality in their operations.

The list of required spaces is attached.

Approach

Our approach to teaching revolves around the notion of the architect as a generalist. We encourage you to approach architecture holistically. We believe that the three attributes of architecture articulated by Vitruvius – *firmitas*, *utilitas*, and *venustas* (*strength*, *utility*, and *beauty*) – are as relevant today as they have ever been, regardless of the climate or culture.

While addressing our appreciation of the history of architecture as well as the social responsibility associated with the profession, we do our best to provide you with a relevant skillset and the practical knowledge necessary for designing buildings in a contemporary setting.

The economic framework and environmental impact of construction will be addressed with appropriate emphasis.

Learning Objectives

Scope

In this master's level course, you will learn to develop a design concept for a large public building. While we focus primarily on concept design, some elements of technical design are included.

The scope of the studio is comparable to the RIBA Plan of Work stage 2 (Concept Design) and the Finnish standard RT 103253 stage D ("ehdotussuunnittelu").

Core Competencies

In this studio you will learn to:

- Plan site use and logistics
- Develop building volumes
- Control proportions, scale, and rhythm of façades
- Solve building program and circulation
- Compose spaces and sequences
- Utilize natural light in architecture
- Design economical, sustainable, and resilient systems
- Apply building materials and finishes
- Draft a construction detail
- Draw floor plans, sections, and elevations
- Produce visualizations
- Prepare presentations
- Communicate clearly and precisely
- Manage and adhere to schedules
- Evaluate progress

Urban planning and workplace design are complementary topics related to the design brief.

SDG's

Aalto University is committed to advancing the UN Sustainable Development Goals as part of its teaching. Relevant targets from SDG7 (Affordable and Clean Energy) and SDG12 (Responsible Consumption and Production) will be addressed in this studio. Specifically, you will gain understanding of the use of renewable energy sources, energy efficiency, and resource efficiency in construction.

Submission Requirements

A digital submission is required for each of the three reviews. Coursework is submitted via MyCourses website at:

https://mycourses.aalto.fi/course/view.php?id=34048

All submitted material, including visualizations, must be original and produced by the author(s).

Presentation Sheets A0	Concept Review	Midterm Review	Final Review
Phasing Diagram Schematic presentation of building phases, including context and logistics. Functions (GFA) and parking places according to Space List Summary.	1:1000	1:2000	1:2000
Program Diagram Schematic presentation of building program and circulation. Functions (NUA) according to Detailed Space List.	1:1000	1:2000	1:2000
Site Plan Building phases, entrances, roof surfaces, hard landscaping, green areas, vegetation, vehicle traffic and delivery, parking, and bicycle and pedestrian routes.	–	1:1000	1:1000
Floor Plans Room tags according to Detailed Space List. Color coding is optional. Load-bearing structure must be clearly indicated.	–	1:500	1:500
Sections and Elevations Relevant sections and elevations necessary for the understanding of the building.	–	1:500	1:500
Typical Floor Plan* Workspace concept, including relevant dimensions, modular grid, load-bearing structure, façade, and furnishing.	–	1:100	1:100
Detail Partial section and elevation of the façade. Schematic presentation of building systems, including ventilation, heating, and cooling.	–	1:20	1:20
Visualizations (2/4* pcs.) Exterior and interior views from eye level without perspective distortion.	volumetric	schematic	finished
Project Description Summary of the design concept, including brief description of the structural system, building materials, and other relevant information regarding construction and use.	–	–	max. 3000 char. incl. spaces

*Group work submission only.

Forms and Calculations	Concept Review	Midterm Review	Final Review
Space List	–	–	xlsx
Resource Efficiency Estimate* Estimate of building mass, expressed in kg/m², and surface-area-to-volume ratio, expressed in S/V.	–	–	xlsx
Carbon Footprint Calculation* Schematic carbon footprint and life cycle assessment, including time before, during, and after occupancy, expressed in kgCO2e (kg of carbon dioxide equivalent).	–	–	xlsx
Cost Estimate* Rough “order of magnitude” (ROM) cost estimate based on area, volume, and general characteristics of the site and design concept, expressed in EUR/brm² (m² GFA).	–	–	xlsx
Self-Evaluation	–	–	xlsx

*Group work submission only.

Scale Model

A volumetric scale model 1:1000 (single material, uniform color, model base according to specification) is required for each on-campus session, including the final review.

Evaluation

The final submission will be evaluated on scale 1–5 (0=failed). Only complete submissions will be evaluated.

Late submissions will be graded with a deduction of -1 or -2, respective to the date submitted. Late submission deadlines can be found from the course schedule.

The evaluation matrix is attached.

Course Schedule and Venue

Tutoring takes place on Tuesdays at 13:15–16:00, September 14th–December 7th.
The lectures take place on Tuesdays at 10:15–12:00, September 14th–October 19th.
The course's final review is on Wednesday, December 15th, at 9:15–16:00.

On-campus sessions take place at the Väre building (room J302). Restrictions may apply due to the coronavirus epidemic.

Online sessions take place via Zoom at:

https://aalto.zoom.us/j/4322406763

Course schedule is attached.

Teachers

Pirjo Sanaksenaho
Architect, Professor

Esa Ruskeepää
Architect, Lecturer

Simon Mahringer
Architect

Erkko Aarti
Architect

Christoph Angehrn
Structural engineer

Mikal Ahmed
Mechanical engineer

Matti Kuittinen
Architect, Professor
Resource-efficient construction and environmental impacts

Contact

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The studio is organized in collaboration with Business Oulu, a public organization of the City of Oulu. Business Oulu is responsible for promoting business and supporting entrepreneurship and employment in the Oulu Region.