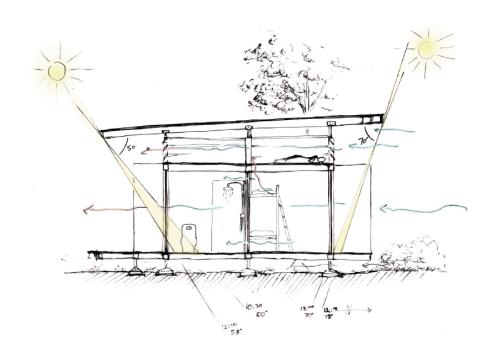


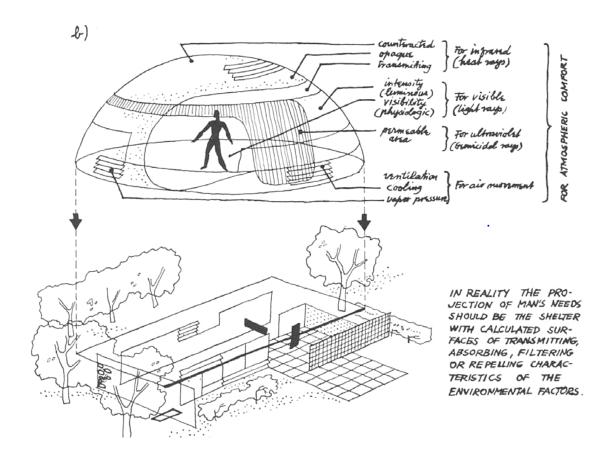
### CLIMATE AND BUILT FORMS

AAR4532+AAR4832 \_ aug/dec 2024





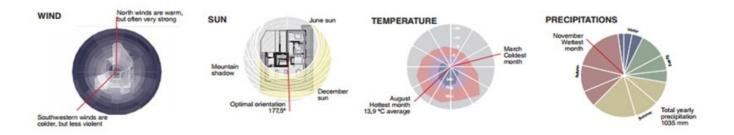
#### FOCUS >> climate as a source for architectural design



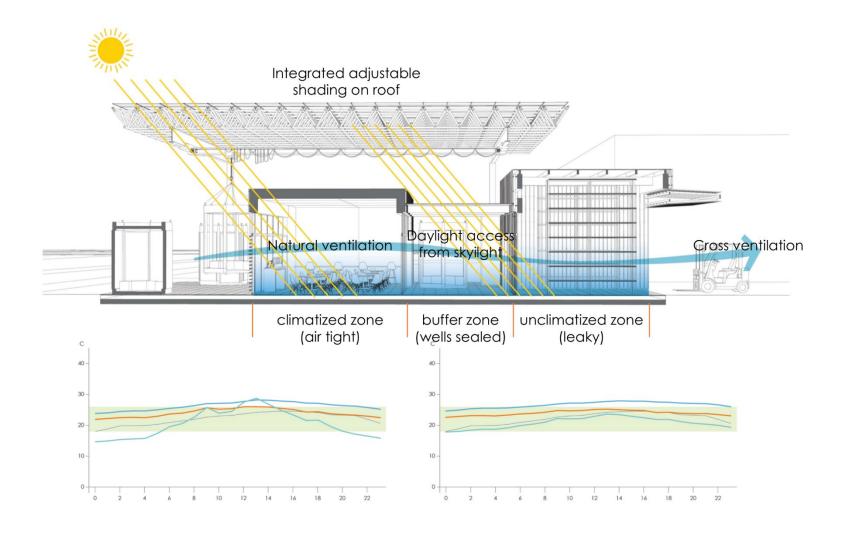
environmental control — (vs) — environmental imagination

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Translating data into diagrams informing the design process

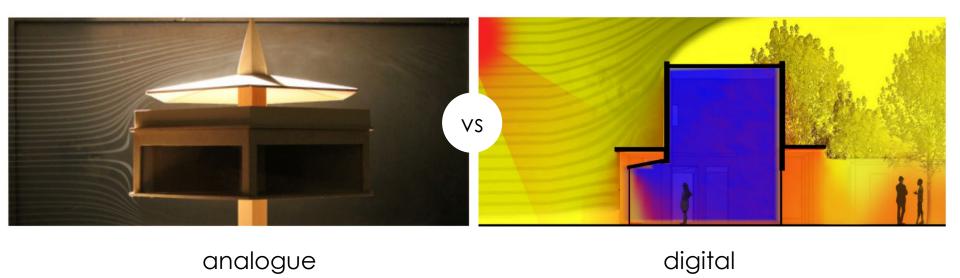


#### **Learning outcome**

Main focus of the course is the **environmental performance** of climate adaptive buildings and their ability to passively create comfortable internal conditions. Thus energy.







- U.1 \_ The architectural potential of climate
- U.2 \_ The bioclimatic approach
- U.3 \_ **FORM** and thermal balance
- U.4 \_ **HEAT** Passive solar heating systems
- U.6 \_ AIR Natural ventilation strategies
- U.7 \_ **LIGHT** The luminous environment

### Task 1 > Task 2

#### CASE STUDY ANALYSES >> ARCHITECTURAL DESIGN

scope \_ learning
principles and tools
for sustainable
architecture while
developing
competences

scope \_ defining a meaningfull design process based on the understanding of the external environment

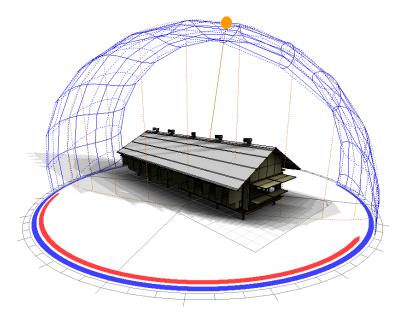


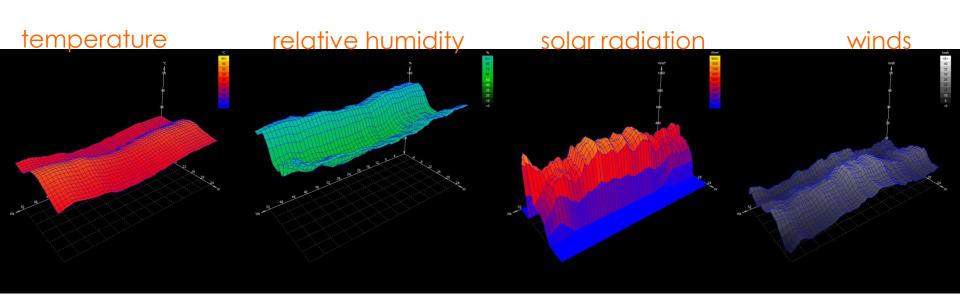
Task 1\_ case study analysis >> learning principles and tools



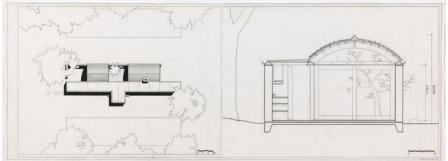




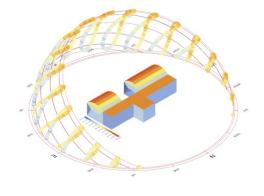


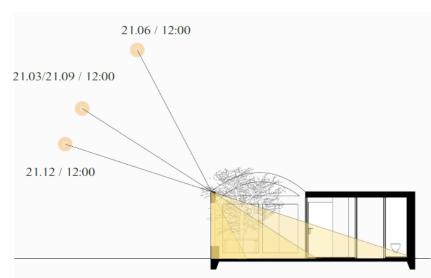


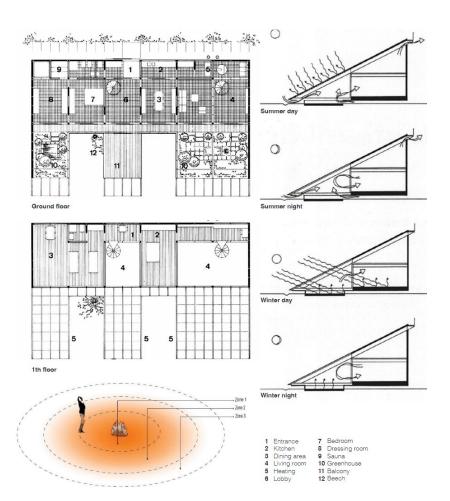


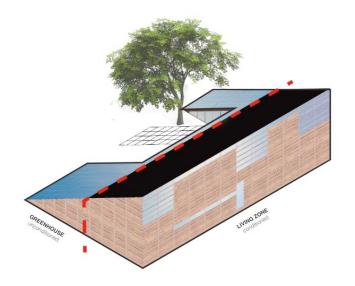


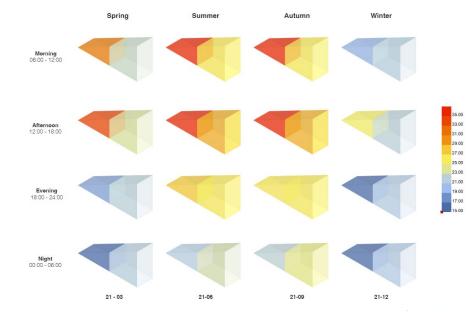


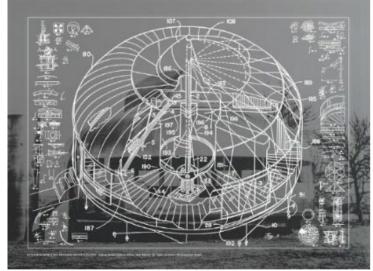




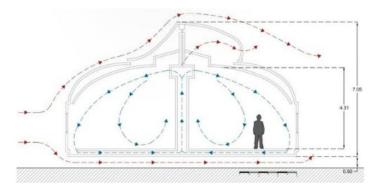


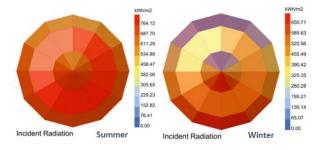


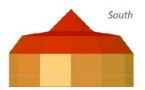




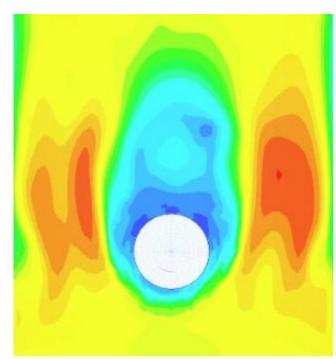




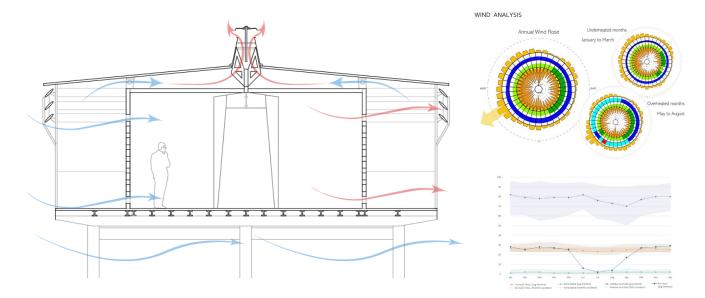


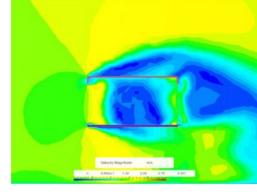


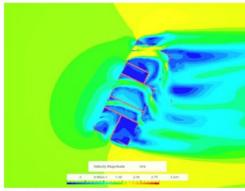












#### Wind simulations in wind tunnel:

Figure 7. Crossection and plan showing the wind pattern and velocity at a base speed of 2 m/s when all the sliding doors are open. Wind coming from west south-west.

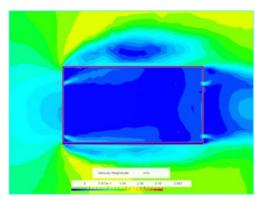
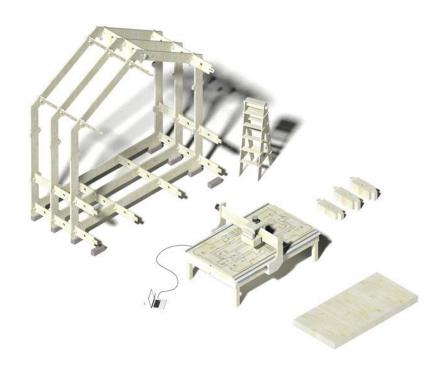


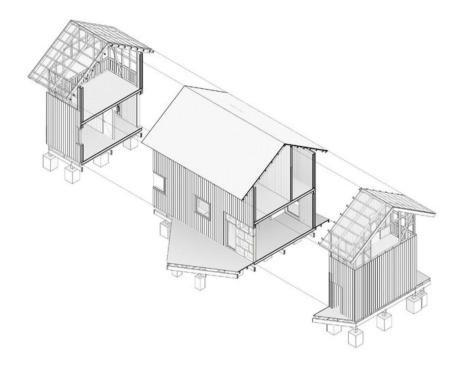
Figure 9. Crossection and plan showing the wind pattern and velocity at a base speed of 2 m/s with the ventilation grills of 1 times 0,02 m $^2$ . Wind coming from west southwest.

Task 2: studio >> climate adaptation

# TASK 2 \_ The bioclimatic shelter – the Wikihouse

Digitally-manufactured building systems for bioclimatic shelters





#### Program

- Prefabricated
- Fast-built
- Climate adapted shelters

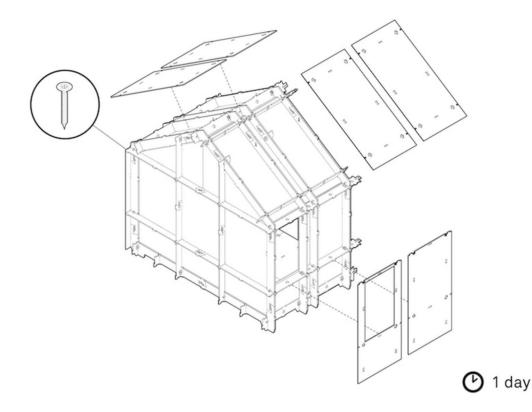


Source: <a href="https://www.archdaily.com/965657/architecture-with-sip-panels-fast-build-high-performance-prefabricated-homes">https://www.archdaily.com/965657/architecture-with-sip-panels-fast-build-high-performance-prefabricated-homes</a>

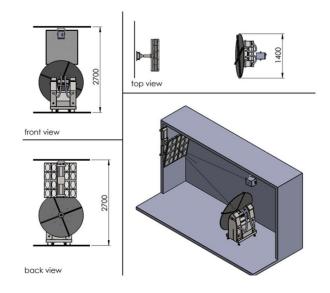


# TASK 2 \_ challenges

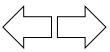
- Detailing for production (open source construction drawing)
- Quantitative + qualitative dimension of environmental design
- Design in four climatic contexts



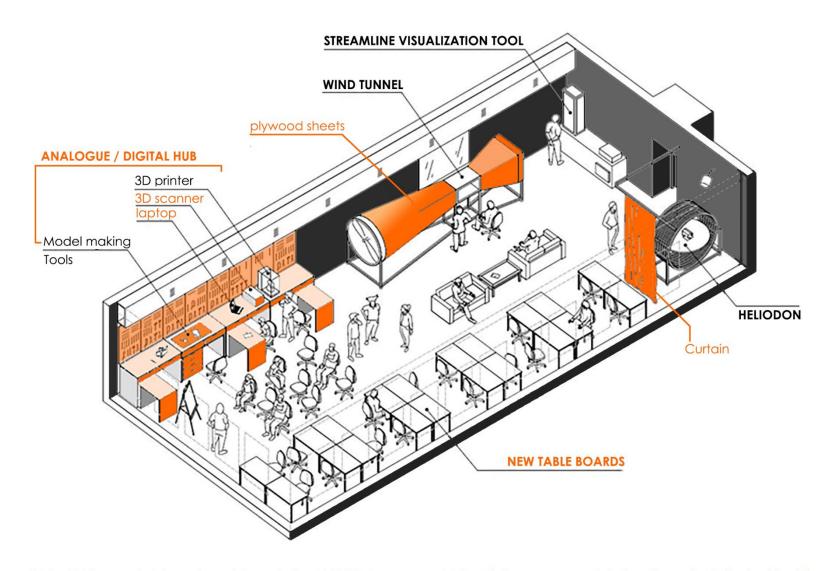












AAA \_ Existing material purchased through the AVIT 2016 program AAA \_ Missing components to buy through AD Strategisk midler

# Task 2 \_ students projects









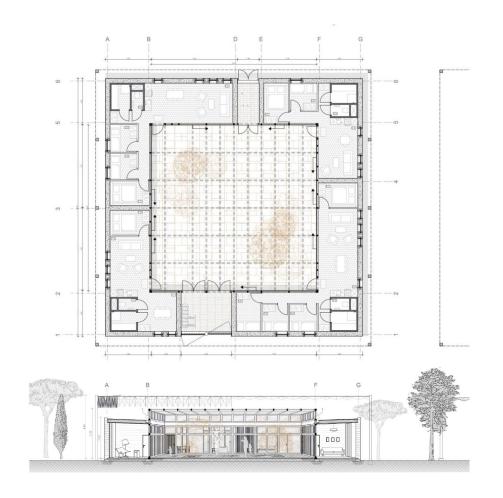
Cold

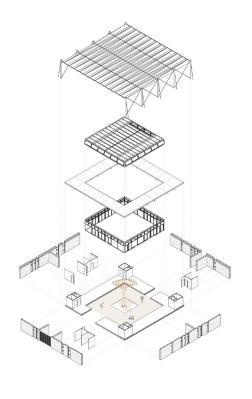
warm humid

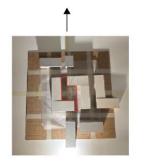
Hot arid

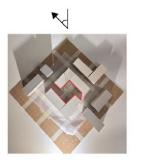
Mediterranean

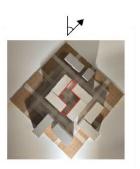
#### Mediterranean







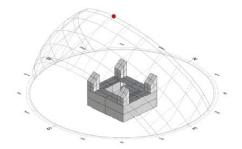




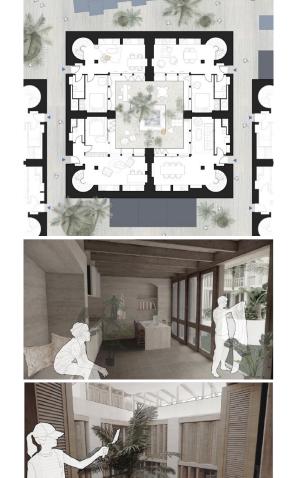




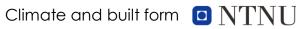
#### Hot-Arid climate





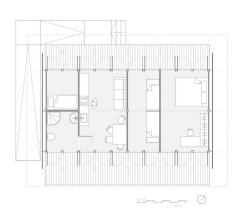


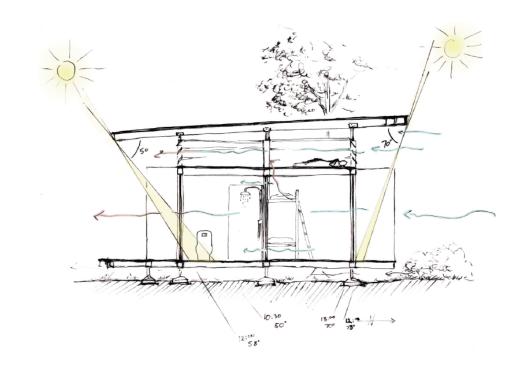






#### Warm humid climate

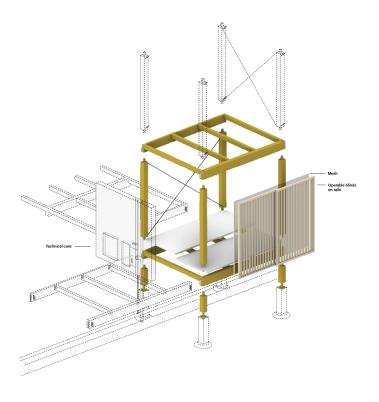




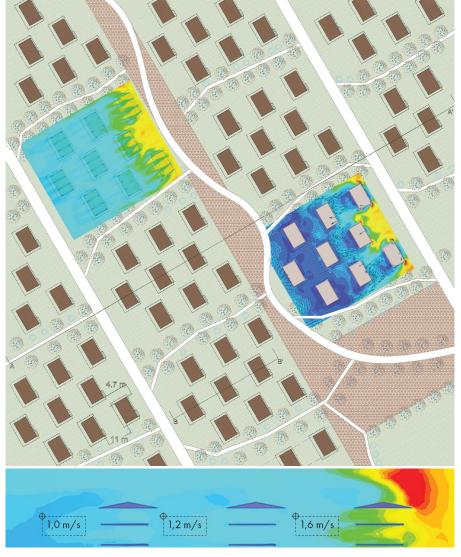




### Warm humid climate



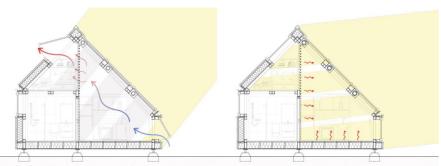






#### Cold climate







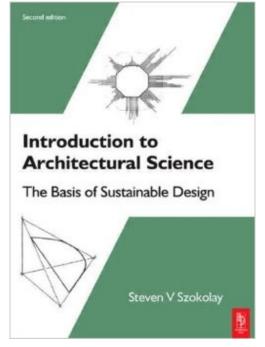
#### Teaching team in 2023:

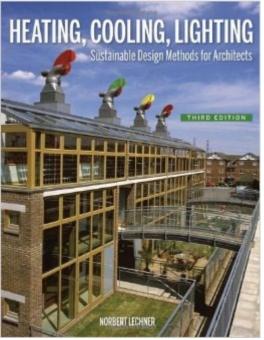
Luca Finocchiaro Anshuman Mishra Ole Jørgen Bryn Bunji Izumi

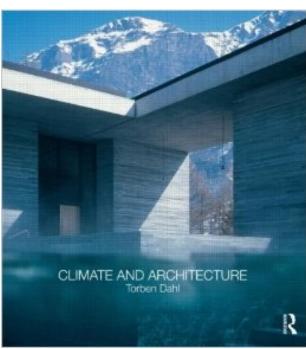
+ 2 Student assistants

Language: English

Course Start: 26. August







- o Steven Szokolay, The basis of sustainable design, Architectural press, USA 2008
- o Norbert Lechner, Heating Cooling and Lighting, John Wiley and Sons Inc., USA 2008
- o Torben Dahl, Climate and Architecture, Routledge ED.
- Victor Olgyay, Design with Climate, Princeton University Press, New Jersey 1963

+ articles and material on itslearning