

PENS-201

Making structural logic

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Cursus	Sem.	Type
Projeter ensemble ENAC	BA4	Opt.

Language of teaching	English
Credits	4
Withdrawal	Unauthorized
Session	Summer
Semester	Spring
Exam	During the semester
Workload	120h
Weeks	
Hours	48 weekly
Lecture	4 weekly
Exercises	22 weekly
Project	22 weekly

Number of positions

It is not allowed to withdraw from this subject after the registration deadline.

Summary

The ENAC week provides students the possibility to engage into an iterative process of testing and exploring structural and material limits and possibilities through the collaborative design and construction of structural elements in folded steel. The ENAC week will take place at EPFL Fribourg.

Content

The ENAC week Making Structural Logic 2024 will analyze selected projects of Jean Prouvé through a physical reiteration of its structural elements. We will work with thin steel sheets that become rigid through folding (tôle pliée). Some structural elements exist from a previous course and can directly be assembled into spatial fragments, others have to be reconceived and built to continue and transform the inherited collective construction. All elements have to be conceived demountable and will be kept after the ENAC week for future iterations.

1_Cyclical thinking: Thinking in life cycles (of function, material life, construction processes) will shift the focus from a linear process towards a final result to an iterative process open to transformation.

2_Physical analysis: We will take apart and reconceive, through drawing and 1:1 fabrication. What are the material limits? What means adequacy of means?

3_Experiential learning: We will draw and construct with our hands, as this is the most immediate way of becoming aware of technique in relation to intention.

4_Material innovation: The testing of material behaviour creates embodied knowledge permitting the invention of innovative solutions.

Keywords

sustainable construction, knowledge transfer, pedagogy of making

Learning Outcomes

By the end of the course, the student must be able to:

- Design a structural element
- Construct a prototype; understand construction as a poetic act
- Dimension structural and material limits
- Test research questions through a pedagogy of making

Teaching methods

Working at a 1:1 scale encourages an inductive and iterative testing, based on constant observation of material properties and structural logic. The so conceived and built prototypes will explore structural and material limits as well as spatial quality and economy of means.

Expected student activities

1. *Introduction:* This exchange will introduce the students to the methodology of the week and to the work of the french constructeur Jean Prouvé.
2. *Fabrication:* Students will work in interdisciplinary groups. The 1:1 fabrication will occupy the largest part of the students time and energy: in bringing together students from the different ENAC sections, this opportunity to design, test and build a 1:1 structure offers a unique chance to directly experience ways of thinking, working together, and making. The human exchanges engendered by the project could test the disciplinary boundaries that sometimes prevent students from exploring, on both a personal and intellectual level, the other sections within the school. The 1:1 fabrication also confronts students with the power of scientific discovery through the observation of nature; forces, materials, behavior and failure become a direct vehicle for learning.

Assessment methods

Ongoing evaluation; students will be evaluated on the basis of the following criteria:

- ability to work in drawing and 1:1 construction;
- capacity to use testing as a means of advancing an architectural and structural idea;
- collaboration (communication, team work, flexibility within different roles);
- engagement (participation, initiative, responsibility)

Supervision

Others The faculty team will be with the students on a continual basis throughout the workshop period.

Resources

Bibliography

Selected Readings

Cruz Prieto, F. (1993). *De l'observation, Vina del mar*: Inéditos.

Billington, D. P. (1985). *The tower and the bridge: the new art of structural engineering*. Princeton University Press.

Jean Prouvé *La poétique de l'objet technique*, Vitra Design Museum, 2006

Peter Sulzer: *Jean Prouvé, Oeuvre complète / Complete Works Vol. 2-4*, Birkhäuser, 2000-2008

Jean Prouvé *La Maison tropicale / The Tropical House*, Editions du Centre Pompidou, 2009

Ressources en bibliothèque

- [Sobre la observación / Cruz](#)
- [The tower and the bridge / Billington](#)
- [La poétique de l'objet technique / Prouvé](#)
- [Jean Prouvé - Oeuvre complète / Complete Works Vol. 2-4](#)
- [La Maison tropicale / The Tropical House / Prouvé](#)