

Name **Principles of Computational Design**

Classroom   
 Studio or workshop   
 External venue   
 Online

Codes **Kód helye**

Host **Design Institute**

	Type	ECTS	Contact hours	Student work	Course type	Semester	Unit
Basic info	Term mark	2	16	44	seminar	2024/2025/1	MA1

Recommendation

Short Description

The aim of the course is to equip students with the knowledge, skills, and perspectives needed to create novel and efficient solutions using computational techniques, while also considering the larger systems they are a part of. The course will encourage students to think creatively and critically about design problems, prepare them to work collaboratively with other designers, engineers, and stakeholders to develop and implement computational design solutions in real-world contexts, also it will invite them to explore the ethical and social implications of computational design, and to consider how these concepts can contribute to more sustainable, equitable, and resilient systems.

Teachers

Name	Contact information	Short bio	Open hours
Ágoston Nagy	<a href="mailto:stc@binaura.net">stc@binaura.net</a> , +36304809295		

Semester schedule

Course scheduling	Weekly class appointments
on Wednesdays	9.10-10.40

#	Date	Weekly educational content
1		systems thinking: understanding how the different parts of a system work together and how changes to one part of the system can affect the whole.
2		generative design: involving algorithms to generate multiple design options automatically based on a set of parameters or constraints.
3		parametric design: involving design systems that can be manipulated through a set of variables or parameters to produce a range of outcomes.
4		optimization: involving algorithms to evaluate design solutions and determine the best outcome based on specific criteria, such as cost, energy efficiency, or aesthetics
5		simulation: involving computational tools to simulate physical phenomena, such as airflow, light, or structural loads, to test and refine design solutions.
6		artificial intelligence: learn from data and perform tasks that typically require human intelligence, such as pattern recognition, decision-making, and natural language processing
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Requirements and evaluation	Assignments	Evaluation criteria	Deadline	% in evaluation

Compulsory readings

Recommended readings

Joshua Noble: Programming Interactivity, O'Reilly, 2009  
 John Maeda: How to Speak Machine, Penguin Publishing Group, 2019  
 Patrick Hebron: Machine Learning for Designers, O'Reilly, 2016  
 Hartmut Bohnacker, Benedikt Gross, and Julia Laub: Generative Design: A Practical Guide Using Processing, 2012  
 Casey Reas and Chandler McWilliams: Form+Code in Design, Art, and Architecture, 2010  
 Jaron Lanier: Who owns the future? HarperCollins Publishers, 2014  
 Barabási László: Network Science, Cambridge University Press, 2016  
 Ville-Matias Heikkilä: Permacomputing, <http://viznut.fi/texts-en/permacomputing.html>  
 Julian Oliver et al: The Critical Engineering Manifesto, <https://criticalengineering.org>

Learnings	Knowledge	Critical understanding of computational design with a systems thinking approach
	Skills	Planning interactive systems built on the techniques of computational design, including algorithms, parametric design, optimization, simulation and artificial intelligence
	Attitude	Independent, analytical reasoning, with a focus on aesthetic qualities and visual clearance
	Responsibility	

- Exemption
- Exemption from attending and completing the course cannot be granted
  - Exemption may be granted from the acquisition of certain competencies and the fulfilment of tasks
  - Some tasks can be substituted with other activities,
  - A full exemption can be granted

Unit	Parallel courses	Course proportion in unit
Interaction Design Basics	Principles of Computational Design	2 ECTS
	Discussing Design	2 ECTS
	Fundamentals of Product Design	2 ECTS

	Design Anthropology	2 ECTS
	Design Ethnography	2 ECTS
	Mastering IxD 1. - The Human Aspect	5 ECTS

Course prerequisites	Is it available as an elective?	Prerequisites in case of elective
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Misc.  
information