Course description (topics)

<table>
<tr><td colspan="5">Title of the course:
Interaction Design Basics: Computational Design Principles</td></tr>
<tr><td colspan="5">Tutors of the course, contact details: Nina Törő, nt@atlasrise.io, +36309199774
Áron Tihanyi, tihanyi.aaron@gmail.com, +36205547774</td></tr>
<tr><td>Code:
M-ID-101-COMP-DESIGN</td><td>Related curriculum (programme/level):
Research & Innovation IxD MA</td><td>Recommended semester within the curriculum:
2026/27/1</td><td>Credit:
2</td><td>Number of class hours: 44

Student working hours: 36</td></tr>
<tr><td>Related codes:
ER-ID-MA-262701-01</td><td>Type:
(seminar/lecture/class work/consultation, etc.) Class Work, seminar</td><td>Can it be an elective course? No</td><td colspan="2">In case of elective what are the specific prerequisites:
-</td></tr>
<tr><td colspan="5">Course connections (prerequisites, parallels):

The subject is only considered completed, if the following courses are also completed:

Fogarasy_Interaction Design Basics: Discussing Design, 2 credits
Fogarasy_Interaction Design Basics: Basics of Digital Design, 2 credits
Csertán_Interaction Design Basics: Product Design, 5 credits
Leube_Interaction Design Basics: Design Anthropology, 2 credits
Leube_Interaction Design Basics: Design Ethnology, 2 credits</td></tr>
<tr><td colspan="5">Aim and principles of the course:
The course aims to deconstruct the black box of technology, inviting students to treat computation as an expressive medium rather than just a functional tool. We aim to move beyond mere optimization, encouraging students to find poetry in logic and intentionality.
Students will investigate how sensing, feedback, behavior, and system logic can shape interactive experiences across digital and physical environments as a form of critical inquiry. Through practical workshops and iterative experimentation, participants will gain experience working with contemporary prototyping technologies, including creative coding tools, microcontrollers, sensors, and physical computing platforms. The course treats computation not as a finished product, but as a malleable material to be hacked, maintained and sustained.
The course emphasizes systems thinking, collaborative design processes, and critical forensics of the social, ethical, and environmental implications of computational technologies. Rather than ‘solving’ problems, students work in pairs on an experimental interactive project that grows organically - evolving through weekly hacks, iterative refinements and peer consultations.
The course also serves as a foundational introduction to more advanced computational, robotic, and interactive studio practices offered in later semesters. By mastering the raw materials of computation now, students prepare to subvert and adapt the advanced technologies they will encounter in the future.</td></tr>
<tr><td colspan="5">Learning outcomes (professional and general competences to be developed):

Knowledge: Deep critical literacy of computational systems through an ecological and systemic lens.</td></tr>
</table>

Ability: Competence in architecting interactive systems using expressive algorithms, generative logic and adaptive machine learning, while practicing minimalist and resilient technical execution.
Attitude: A curious, independent and ethically grounded mindset, prioritizing aesthetic intentionality and the poetics of the interface over mere functionality.

Topics and themes to be covered in the course:

- systems thinking and interactive behaviors
- computational thinking and rule-based design
- generative and responsive systems
- physical computing fundamentals: sensors, actuators, and microcontrollers
- embodied and spatial interaction
- prototyping interactive systems through experimentation
- data-driven and adaptive interactions
- artificial intelligence in creative and critical design contexts
- experimentation with light, sound, motion, and spatial interaction
- ethical and social implications of computational technologies

Course structure, nature of the individual sessions and their timing (in case of several teachers' involvement, please indicate the distribution of their teaching input:

In most classes, the course events will be structured as the following:

1. Discussion and reflection on assigned readings or references
2. Short theoretical introduction
3. Interactive quiz or discussion activity or unplugged exercises
4. Technical workshop or prototyping exercise
5. Group project development and consultation
6. Collective presentation and feedback

Students will share their impressions, insights and giving feedback to each other

Students work in pairs throughout the semester on a single, evolving interactive system or prototype.
The course includes regular experimentation with physical computing tools, sensors, and computational prototyping technologies.

Learning environment: classroom & online

Assessment:

- active participation in discussions, workshops and peer-to-peer mutual aid
- depth of reflection on weekly readings and the ability to connect theory and practice
- iterative development of the semester project, showing how the project branched and grew through weekly sketches
- the quality of experimentation with hardware and code, the ability to adapt and bend tools to artistic intent
- clarity of the poetic or critical premise behind the interactive work

- the ability to communicate the project's logic and aesthetic soul through visual and verbal storytelling

Requirements to be met:
presentation (visual introduction of the class work)

To complete the course you must deliver:

A behind-the-scenes document capturing

- A functional demonstration of the project/prototype (presented in the final session).
- A behind-the-scenes document capturing the evolution of the project, including the initial concepts, the logic flows and the pivotal moments of experimentation that shaped the project.
- A 1 minute video (16:9) that demonstrates your concept. The minimum resolution is Full HD, format is MP4. The video should be self explanatory using narration and subtitles/labels. The video can be recorded digitally or using any device available (e.g. your own phone).
- A printable file format for a poster (.PDF) that describes your project and the design process you've used through. A template will be provided for this purpose.
- 1x "hero image" that demonstrates your end result. (preferably without additional text) Size: 2880x1440
- 1x "square image", that demonstrates your end result. (preferably without additional text) Size: 1080px by 1080px

Method of assessment:
practical demonstration

Recommended Literature:

James Bridle: New Dark Age: Technology and the End of the Future, Verso, 2018
Cory Doctorow: The Internet Con: How to Seize the Means of Computation, Verso, 2023
Golan Levin and Tega Brain: Code as Creative Medium, The MIT Press, 2021
Ruha Benjamin: Race After Technology: Abolitionist Tools for the New Jim Code, Polity, 2019
Kate Crawford: Atlas of AI, Yale University Press, 2021
Jenny Odell: How to Do Nothing: Resisting the Attention Economy, Melville House, 2019
Yuk Hui: Recursivity and Contingency, Rowman & Littlefield International, 2019
Mindy Seu: Cyberfeminism Index, Inventory Press 2023
Julia Watson: Lo—TEK. Design by Radical Indigenism, Taschen, 2020
Julian Oliver et al: The Critical Engineering Manifesto, https://criticalengineering.org
Ville-Matias Heikkilä: Permacomputing, http://viznut.fi/texts-en/permacomputing.html

Other information:
On Wednesdays 13:40-16:30 in room B_106

Recognition of knowledge acquired elsewhere/previously/validation principle:
-

Out-of-class consultation times and location
-