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|Comunicazione Multimediale & Tecnologie dell'Informazione|

C O U R S E P R O G R A M



Sustainable Interaction Design
Paolo Atzori 2022



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INTERACTION DESIGN

S U S T A I N A B L E

COURSE THEME

'IT'S NOT DESIGN UNLESS IT'S SUSTAINABLE'

The nature of Design has always been related to the socio-technological forces of its time. In the last decade, the impact of information and communication technologies (ICT) has influenced every social, economic and cultural aspect.

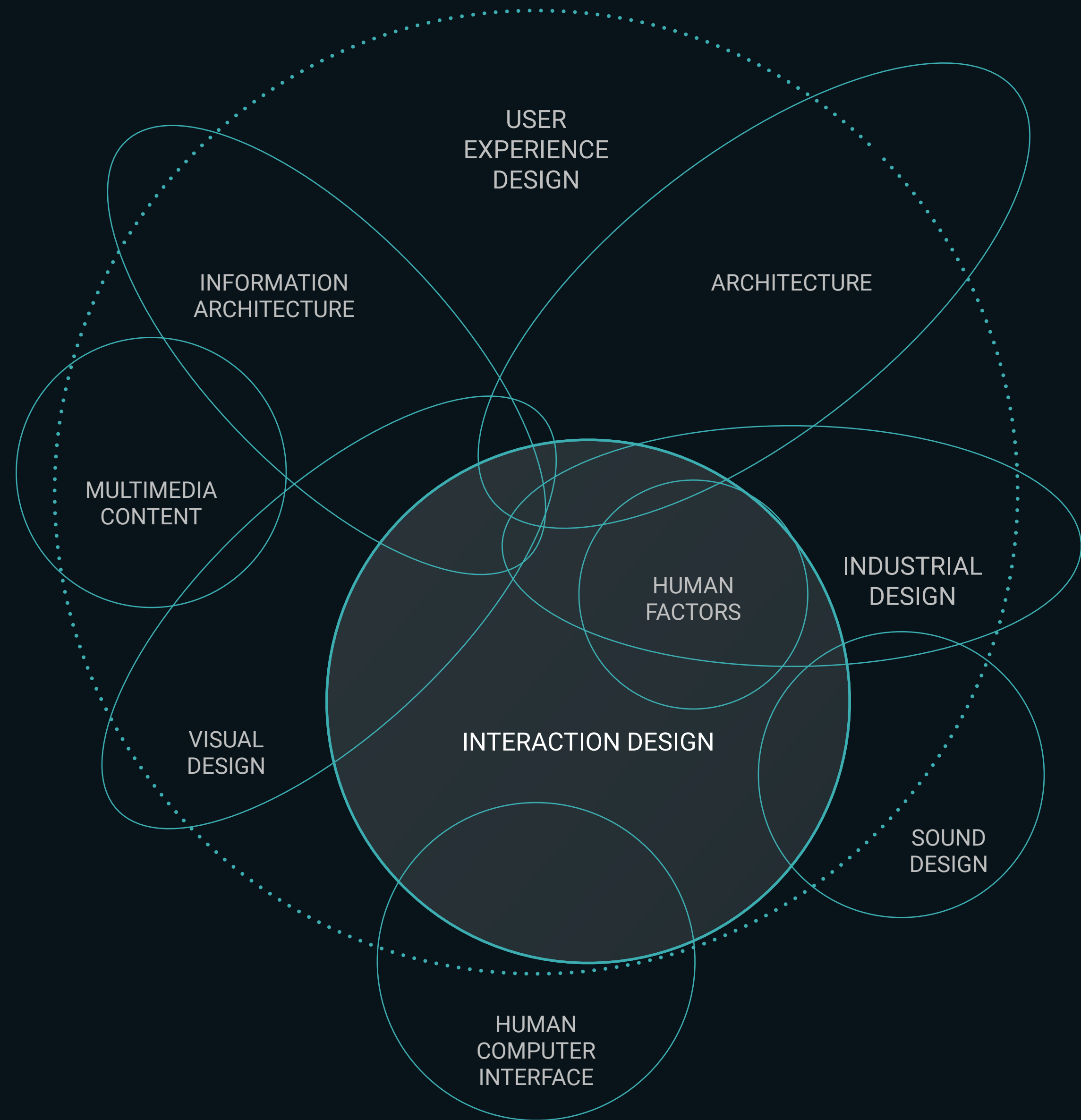
These technologies act as environmental and anthropological forces, pervasively determining interactions with physical and intellectual reality. Starting from the consideration that the **ecological crisis** is the greatest planetary emergency and bearing in mind that 80% of the environmental impact of everyday products, services and infrastructures is already determined in the design phase, the main question of design is how to improve our lives and our environment significantly.

The program of 2023 course is focused on understanding the interrelationships between **man, environment and ICT**, on imagining, conceiving, and experimenting interactions through a specific methodology (**Environment Centred Design**) and **transdisciplinary** approach, pursuing a design centered on man but above all on environmental sustainability. The backbone of the course is indeed focused on the **link** between **environmental sustainability** and the **enabling technologies** of the fourth industrial revolution; how technologies can be used to **design interactive** systems 4.0, the so-called **cyber-physical systems** (CPS), which are essentially the new products and services of the digital revolution, to improve the use of natural resources and promote more sustainable actions.

The planning part of the course refers to an intelligent city model called "Enhanced City"; an idea of the city of the Fourth Industrial Revolution, an operational concept that combines the idea of 'smart' with those of a creative and cultural city, in which the form of 'intelligence' derives substantially from the urban implementation of enabling technologies for a sustainable interconnected city of the 4.0 era.



UX/IxD TRANSDISCIPLINARY
FRAMEWORK



CONTENTS



TRAINING OBJECTIVES

- The course highlights the main strategies and representation techniques for the development and communication of an Interaction Design project.

Students will learn how to use new tools and apply techniques collaboratively through a project that will be started together with the teacher in the second half of the course and which will be concluded with the presentation to the exam. These are the main objectives:

- acquire an autonomy of reading and understanding of emerging techno-scientific processes and stimulate the formation of a personal idea on the transformations taking place, also in relation to the more general cultural trends

- learn the practice of Interaction Design in the context of a practical and collaborative project: work in teams to solve complex problems and create interactive, innovative and sustainable experiences, services and products by implementing the specific plans of Human Computer Interaction (HCI): User Experience (UX) User Interface (UI), Interaction Design (IxD), Information Architecture (IA)

- achieve a specific preparation for the realisation of an interactive prototype in one of the design fields presented during the lessons

- provide training in transdisciplinarity, team working and project management, knowing how to lead, share and communicate a project, encouraging the decision-making, creative and management skills of the study group

- enhance the soft skills and adaptability of individual students; knowing how to propose innovative solutions that respect the criteria of sustainability and inclusiveness

- increase critical knowledge on environmental sustainability by examining the objectives of the UN Agenda 2030.



METHODOLOGY

The **methodology** of the Interaction Design course is based on a reworking of the conceptual structure of *Design Thinking* integrated with the *Double Diamond* process as defined by the British Design Council. The main change consists in assuming the **centrality** not only of man but also and above all the **environment** to define a coherent sustainable design.

The resulting method is called *Environment Centred Design (ECD)*.

Interaction design planning is based on 3 fundamental principles: **Sustainability, Circular Economy** and **Digital Sovereignty** and it is carried out by - iteratively- going through all the phases of the design methodology: **research, ideation, wireframing/prototyping, testing** and **implementation**.

To meet the sustainability requirements and design compatible interactive systems, some useful **models** will be introduced, such as *footprints* (Carbon, Eco, Water), *urban metabolism*, *human exposome* and characteristics of Industry 4.0 such as *Digital Twins* and *CPSS* (Cyber-Physical-Social-System).



METHOD



USER Centered Design



HUMAN Centered Design



ENVIRONMENT Centered Design



3

PREREQUISITES

Prerequisites of the course are to have hard/soft skills in at least one of the 7 fields listed below:

- 1 knowledge of UX/UI design tools for wireframing and prototyping (***Figma, InVision, Framer, Principle, UxPin, Sketch, Maze, Marvel, Adobe XD, ProtoPie, Wireframe.cc, Axure***)
- 2 knowledge of the main Interface Design platforms (***Max-Msp, VVVV, Touch Designer, Processing / P5***)
- 3 knowledge of Interaction Design programming languages (***Java, Python, Unity, HTML, CSS, JavaScript, Swift***)
- 4 knowledge of new digital representation techniques (data visualization, 3D simulation, graphics and generative video)
- 5 knowledge of Internet Of Things Cloud Design (***Arduino, Raspberry***, Sensor Networks, LoRaWAN, etc.)
- 6 have completed design experiences in the multimedia field with interdisciplinary methods and practices
- 7 Having completed studies in Humanistic, Social, Cognitive, Environmental, Psychological, Philosophical Sciences; have knowledge of the theoretical and cultural field of interaction and media design

EDUCATIONAL GOALS

The course highlights the main strategies and representation techniques for the development and communication of the project. Students will learn how to use tools and apply techniques through a project that will be started together with the teacher in the second half of the course and which will be concluded with the presentation to the exam. These are the main objectives:

- acquire an autonomy of reading and understanding of emerging techno-scientific processes and stimulate the formation of a personal idea on the transformations taking place, also in relation to the more general cultural trends
- learn the practice of Interaction Design in the context of a practical and collaborative project: work in teams to solve complex problems and create interactive, innovative and sustainable experiences, services and products by implementing the specific plans of Human Computer Interaction (HCI): User Experience (UX) User Interface (UI), Interaction Design (IxD), Information Architecture (IA)
- achieve a specific preparation for the realization of an interactive prototype in one of the design fields presented during the lessons
- provide training in interdisciplinarity, team working and project management, knowing how to lead, share and communicate a project, encouraging the decision-making, creative and management skills of the study group
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I x D COURSE

TOOLS

01



MIRO

Collaborative Digital Whiteboard

04



INFOGRAM

infographic and visualization

02



SLACK

Cloud-based project collaboration & team interaction software

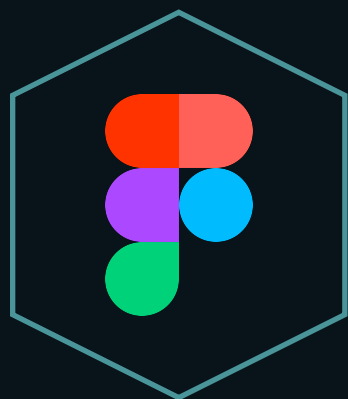
05



TOUCHDESIGNER

Integrated Interface Design Environment

03



FIGMA

Ux/UI Wireframing & Prototyping

06



ARDUINO Cloud

IoT Interface Design



5

EXAM PROJECT

- As previously mentioned, the theme of the exam is *Enhanced City*, the city of the Fourth Industrial Revolution.
- Due to the fundamental transdisciplinary nature of Interaction Design course, both research and prototyping will be carried out in groups.
- Student teams will develop a project of new urban systems and services, operated by interactive interfaces and applications, made up of sensors connected to IoT networks, Artificial Intelligence systems, Augmented Reality scenarios, digital twins models, etc.:
the city implementation of the enabling technologies of Industry 4.0.

ASSIGNMENTS

- During the course there are will be 3 tests;
- at least 2 revisions are foreseen during the planning, carried out by the teacher for each team.
- The final grade will be determined by the sum of the points obtained on each test, together with the evaluation of the exam.
- To reach the maximum score, it is advised to read at least one of the texts indicated in the course bibliography.

1

Selfportrait

- The first task consists in the sketch of a digital self-portrait to be created with a technique chosen by the student;

(maximum score: 3/30)



2

Team Building & Research

- An intermediate test will follow; after forming the teams, through a brainstorming, the students will decide which themes and problems to address with their projects.

By adopting the methodology of the course, they will start the research phase, ending with the conception of the project to be carried out in the next assignment. The result will be exposed by the team in an interactive multimedia presentation.

(maximum score: 7/30)



3

Project Development

- The plan defined in the first assignment will form the basis for the third test which consists in the design and implementation of a prototype. The interaction design process will follow an iterative path, in which, the skills acquired in the other UX courses will be applied to create a coherent, intuitive and emotionally engaging experience.

(maximum score: 18/30)

BIBLIOGRAPHY

- [1] Brynjolfsson, Erik-McAfee, -Andrew, The Second-Machine-Age, 2014
- [2] Cooper Alan, Reimann Robert, Cronin David, About Face 3: The Essentials of Interaction Design, 2016
- [3] Garrett Jesse James, The Elements of User Experience User-Centered Design for the Web and Beyond, 2011
- [4] van Dijck, Jose: The Culture of Connectivity, Oxford U.P. 2013
- [5] Floridi Luciano, La Quarta Rivoluzione, Raffaello Cortina, 2017
- [6] Floridi Luciano, Pensare l'Infosfera, Raffaello Cortina, 2020
- [7] Friess Peter, Vermesan Ovidiu, Building the Hyperconnected Society, IERC 2015
- [8] Fry Tony, Design futuring sustainability; ethics and new practice, BERG 2009
- [9] Giovagnoli Max, Transmedia. Storytelling e comunicazione, Apogeo 2013
- [10] Jenkins Henry, Cultura Convergente, Apogeo 2007
- [11] Maeda John, Le leggi della semplicità, ISBN 88-424-2005-0, Bruno Mondadori 2006
- [12] Moggridge Bill, Designing interaction, The MIT Press 2007
- [13] Moore Jason, Anthropocene or Capitalocene, Kairos-PM Press, 2016
- [14] Timothy Morton, Hyperobjects: Philosophy and Ecology after the End of the World, University of Minnesota Press, 2013
- [15] Norman, Donald, Il design del futuro, ISBN 978-88-503-2634-1, Apogeo 2008
- [16] Rogers Yvonne, Sharp Helen, Preece Jenny, Interaction Design: Beyond Human - Computer Interaction, John Wiley & Sons, 2015
- [17] Rushkoff Douglas, Present Shock: When Everything Happens Now, Penguin 2013
- [18] Saffer Dan, Designing for Interaction Creating Smart Applications and Clever Devices, AIGA 2006
- [19] Schwab Klaus, la quarta rivoluzione industriale, WEF 2016
- [20] Wilson Stephen, Information Arts: Intersections of Art, Science, and Technology MIT, 2010
- [21] Zuboff Shoshana, The Age of Surveillance Capitalism, 2019

