Syllabus

Course Description

Course Title	Interactive Interface Design and Development
Course Code	76267
Course Title Additional	
Scientific-Disciplinary Sector	INFO-01/A
Language	Italian
Degree Course	Bachelor in Computer Science
Other Degree Courses (Loaned)	
Lecturers	Prof. Rosella Gennari, Rosella.Gennari@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/8607
Teaching Assistant	
Semester	Second semester
Course Year/s	2
CP	6
Teaching Hours	30
Lab Hours	30
Individual Study Hours	90
Planned Office Hours	9
Contents Summary	Theory - Theoretical foundations of human-centred interaction design (e.g. mental models, Norman's Seven Stages of the Action model) - Theories and models for interaction analysis (e.g. personas and PACT, scenarios, HTA) and for interaction design (e.g. DIRA, use cases, user flows, wireflows/state diagrams) - Approaches, methods and metrics for the analytical evaluation (e.g. walkthroughs), with an introduction to the empirical evaluation (e.g. usability testing and performance metrics) Laboratory

	- Approaches, techniques and tools for prototyping - Analysis of case studies and modelling of interactive solutions - Development and evaluation of interactive prototypes
Course Topics	---------- LECTURES ---------- During the lectures, the following topics will be covered. 1. Theoretical Foundations of Human-Centred Interaction Design * Introduction to human-centred interaction design: theoretical and process-oriented approaches * Mental models and conceptual models * Human factors relevant to interaction, e.g. visual perception * Introduction to usability and user experience, and their key dimensions * Overview of accessibility and inclusion as design principles 2. Theories and Models for Interaction Analysis and Design * Introduction to interaction analysis: people, goals and context of use * User analysis and reference models, e.g. PACT * Context analysis and reference models, e.g. task analysis 3. Interaction Design * Principles and major patterns for the design of interactive interfaces * Definition of interaction and interface requirements according to recent models, e.g. DIRA

	* Conceptual representations of interaction with interfaces, e.g. use cases, user flows, wireflows and state diagrams 4. Introduction to Interaction Evaluation Approaches, Methods and Metrics * Comparison between analytical and empirical evaluation * Analytical evaluation: objectives, participants, tools and examples (e.g. walkthroughs) * Introduction to empirical usability evaluation: objectives, participants and tools (e.g. usability testing, think-aloud protocols), satisfaction questionnaires (e.g. SUS), and performance metrics (e.g. success rate for formative evaluations and confidence interval calculation using the adjusted Wald method) ---------- LABORATORY SESSIONS ---------- Durante labs, the acquired knowledge will be applied to case studies assigned by the teacher yearly. 5. Analysis of Case Studies and Development of Conceptual Models * Analysis of case studies * Development of conceptual models 6. Prototyping and Evaluation * Low- and medium-fidelity prototyping, e.g. storyboarding, sketching and wireframing with Balsamiq * High-fidelity prototyping, e.g. creation of wireflows with Figma * Usability and user experience evaluation of design solutions
Keywords	Human-computer interaction, interaction analysis, interaction modelling, interface prototyping, usability and user experience evaluation

Recommended Prerequisites	Software development and programming knowledge
Propaedeutic Courses	
Teaching Format	Interactive frontal lectures, experiential learning activities, hands-on activities related to prototyping and evaluation, discussion and peer review
Mandatory Attendance	Attendance is not compulsory but highly recommended. Non-attending students must contact the lecturer at the start of the course to agree on the modalities of the independent study.
Specific Educational Objectives and Learning Outcomes	Knowledge and Understanding – D1.17 Know the main methods for the design of interactive smart objects for IoT Applying knowledge and understanding – D2.14 Be able to develop Mobile applications. – D2.16 Ability to develop applications in the web area. – D2.19 Be able to apply the own knowledge in different working contexts. – D2.23 Be able to coordinate small project teams and to interact with members of the group. – D2.25 Be able to apply interactive design principles and patterns for IoT solutions and smart objects. Ability to make judgments – D3.2 Be able to work autonomously according to the own level of knowledge and understanding. Communication skills – D4.1 Be able to use one of the three languages English, Italian and German, and be able to use technical terms and communication appropriately. – D4.5 Be able to work in teams for the realization of IT systems. Learning skills – D5.2 Have acquired learning capabilities that enable to carry out project activities in companies, public institutions or in distributed development communities.
Specific Educational Objectives and Learning Outcomes (additional info.)	By the end of the course, students will be able to analyse human-computer interaction problems by considering users, activities and context of use; apply models and techniques for the design of interactive interfaces and systems; represent and communicate design solutions through appropriate analysis and design artefacts;

	develop interactive prototypes at different levels of fidelity; and critically evaluate the quality of interaction using analytical evaluation methods and basic empirical approaches.
Assessment	Assessment is based on a written examination designed to evaluate: (1) knowledge and understanding of the theoretical concepts covered in the course; and (2) the ability to apply these concepts to the analysis, design, and evaluation of interactive systems. The examination includes: (1) questions and exercises relating to the theoretical content of the module; and (2) practical exercises aligned with the laboratory activities, covering the analysis, modelling, design, prototyping, and evaluation of interaction. Students who attend at least 70% of the overall teaching activities may undertake a small project as part of the laboratory component, developed and presented during laboratory hours. The project may contribute up to a maximum of 3 bonus marks towards the final grade. The number of bonus marks awarded depends on the quality of the project and will be recognised only if a minimum mark of 18/30 is achieved in the written examination.
Evaluation Criteria	Assessment is designed to verify the acquisition of theoretical knowledge relating to human-computer interaction and the ability to apply such knowledge to the analysis, design, prototyping and evaluation of interactive interfaces. Particular attention is given to the ability to select, use and apply appropriate models, to produce coherent artefacts (for analysis, design, prototyping and evaluation), and to provide a critical justification for the choices made.
Required Readings	Slides by the teacher. Selected materials from: 1) Kasper Hornbæk, Per Ola Kristensson, and Antti Oulasvirta (2025), Introduction to Human-Computer Interaction: https://aaltodoc.aalto.fi/bitstreams/976a5436-ad4b-4ecd-94d3-003e4034aaeb/download

	2) Rogers, Y. and, Sharp, H. and Preece, J. (2023). Interaction Design, 6th edition, Safari Tech Book: https://learning.oreilly.com/library/view/interaction-design-6th/9781119901099/ 3) Measuring the User Experience, 2nd Edition, Bill Albert, Tom Tullis, Published by Morgan Kaufmann, Safari online Selected papers assigned by the teacher during classes.
Supplementary Readings	
Further Information	
Sustainable Development Goals (SDGs)	Industry, innovation and infrastructure, Quality education