



Course Syllabus

Course Code COMP-263	Course Title Human-Computer Interaction	ECTS Credits 6
Prerequisites Sophomore standing	Department Computer Science	Semester Fall/Spring
Type of Course Elective	Field Computer Science	Language of Instruction English
Level of Course 1 st Cycle	Lecturer(s) Dr Vasso Stylianos	Year of Study 2 nd
Mode of Delivery Face-to-face	Work Placement N/A	Corequisites None

Course Objectives:

For end-users, the interface is the system. So design in this domain must be interaction-focused and human-centered. Students need a different repertoire of techniques to address this objective. Thus, the main objectives of the course are:

- Provide an overview of the concepts relating to the design of human-computer interfaces in ways making computer-based systems comprehensive, friendly and usable.
- Understand the theoretical dimensions of human factors involved in the acceptance of computer interfaces.
- Understand the important aspects of implementation of human-computer interfaces.
- Identify the various tools and techniques for interface analysis, design, and evaluation.
- Identify the impact of usable interfaces in the acceptance and performance utilization of information systems.
- Identify the importance of working in teams and the role of each member within an interface development phase.

Learning Outcomes:

After completion of the course students are expected to be able to:

Understand the Computer and Human-Computer Interaction (HCI). Students will understand what interaction design is. We look at the difference between good and poor design, highlighting how products can differ radically in how usable they are. We then describe what and who is involved in the process of interaction design. The user experience, which has become a central

concern of interaction design, is then introduced. Finally, we outline how to characterize the user experience in terms of usability, user experience goals, and design principles.

Have an insight to Human Capabilities. Students should be able to understand core cognitive aspects of interaction design. Specifically, we consider what humans are good and bad at and show how this knowledge can be used to inform the design of technologies that both extend human capabilities and compensate for their weaknesses.

Interactive Systems Design. Students should have a clear understanding of HCI principles that influence a system's interface design, before writing any code. Such preliminary thinking involves ideas about user needs and demands and what kinds of designs might be appropriate for each implementation context.

Interfaces' Design and Prototyping. Students will understand that the interfaces' design emerges iteratively, through repeated design–evaluation–redesign cycles involving users. Broadly speaking, there are two types of design: conceptual and physical. The former is concerned with developing a conceptual model that captures what the product will do and how it will behave, while the latter is concerned with details of the design such as screen and menu structures, icons, and graphics.

Windows Concepts and Interfaces. Students will have the skills and knowledge to consider how to design interfaces for different environments, people, places, and activities. To begin with, we give an overview of paradigmatic developments in interaction design. We then present an overview of the major interface developments, ranging from WIMPs (windows, icons, menus, pointers) to wearables. For each one, we outline the important challenges and issues confronting designers, together with illustrative research findings and products.

Quantitative Analysis – Evaluation – Redesign. Students will have the skills to understand why evaluation is important, what needs to be evaluated, where that evaluation should take place, and when in the product lifecycle evaluation is needed. We introduce three evaluation approaches and key evaluation methods, and examine short evaluation case studies which illustrate them. For each one we look at the aim of the evaluation, at what stage the evaluation was done during design, the techniques that are used to collect and analyze the data, and the challenges that the evaluators encountered).

Research Topics in HCI. Students will be able to understand the multi- disciplinary of the subject by presenting research dimensions on various areas, such as cognitive psychology / sciences, sociology, computing, mobility, etc., and with the use of real cases will realize the importance of incorporating such issues in the design and development of interfaces and information systems increasing usability and satisfaction.

Course Content:

1. **Introduction to Human-Computer Interaction:** Includes the difference between good and poor interaction design, what interaction design is and how it relates to human-computer interaction and other fields, what is involved in the process of interaction design, the different forms of guidance used in interaction design, etc.
2. **Interaction Design:** Involves communication and collaboration, the main kinds of social mechanisms that are used by people to communicate and collaborate, the range of collaborative systems that have been developed to support this kind of social behavior, how field studies and socially based theories can inform the design of collaborative systems, etc.
3. **Understanding Users, Cognitive and Affective Factors:** Involves what cognition and affection is and why it is important for interaction design, the main ways cognition and affection has been applied to interaction design, a number of examples in which cognitive research has led to the design of more effective interactive products, mental models, conceptual frameworks that are useful for interaction design, etc.
4. **The Computer and Human-Computer Interaction:** Involves the various devices and implementation beds as well as technological constraints and opportunities, the problem space, how to conceptualize interaction, the pros and cons of using interface metaphors as conceptual models, the relationship between conceptual design and physical design, etc.
5. **Web Interfaces:** Concerns an introduction of the notion of a paradigm and set the scene for how the various interfaces have developed in interaction design, overview of the many different kinds of interfaces, highlight of the main design and research issues for each of the different interfaces, considerations which interface is best for a given application or activity, etc.
6. **Introduction to Interactive System Design:** Includes what 'doing' interaction design involves, some advantages of involving users in development, the main principles of a usercentered approach, etc.
7. **Discuss Data Gathering and Requirements Analysis with focus in HCI aspects:** Discusses how to plan, run and analyze successful data gathering schemes based on previous knowledge, which could include tools and methods as interviews, questionnaires, observations, etc. taking into consideration the HCI influential aspects taught in previous chapters.
8. **Interfaces Design and Prototyping:** Includes prototyping and different types of prototyping activities with regards to systems interfaces design, production of simple prototypes from the models developed during the requirements activity, production of a conceptual model for a product, use of scenarios and prototypes in design, a range of tool support available for interaction design, etc.
9. **Usability Testing & Analytic Evaluation:** Involves usability testing through examples, the basics of experimental design, the methods used in usability testing, the role of field studies in evaluation, the important concepts associated with inspection methods, how heuristic evaluation can be adapted to evaluate different types of interactive products, what is involved in doing heuristic evaluation and various kinds of walkthrough, how to perform predictive technique, and when to use them, the advantages and disadvantages of using analytical evaluation, etc.
10. **Evaluation:** Includes the conceptual, practical, and ethical issues involved in evaluation, how observation, interviews, and questionnaires are used in evaluation, the key concepts and terms used in evaluation, the three main evaluation approaches and key evaluation methods within the context of real evaluation studies, how the approaches and methods are used for different purposes at different stages of the design process, the practical challenges that evaluators have to consider when doing evaluation, etc.

Learning Activities and Teaching Methods:

Lectures, Discussions with peer participation, Case Analysis, Project

Assessment Methods:

Final Exam, Coursework, Other activities (Discussions, Case analysis, etc.)

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Interaction design: Beyond Human-Computer Interaction, 6/e	Y. Rogers, H. Sharp, J. Preece	John Wiley & Sons	2023	978-1-119-90109-9

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Designing the User Interface, 5/e	Shneiderman B., Plaisant C., Cohen M., Jacobs S.	Pearson	2013	9781292037011
Intelligent User Interfaces: Adaptation and Personalization Systems and Technologies Systems	C. Mourlas, P. Germanakos	IGI Global	2008	
Interactive Technologies: HCI Models, Theories, and Frameworks: Toward a Multidisciplinary Science	J. Carroll	San Francisco: California: Morgan Kaufmann	2003	
Understanding Mobile Human-computer Interaction	S. Love	Amsterdam: Butterworth-Heinemann	2005	
The Human-dimensions of Human-computer Interaction:	E. McKay	Amsterdam: IOS Press	2008	