COURSE DATA

DATA SUBJECT

Code: 34660
Name: Human computer interaction
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1400 - Degree in Computer Engineering	Escola Tècnica Superior d'Enginyeria	2	First quarter
1936 - Double Degree Program in Mathematics-Telematics Engineering	Facultat de Ciències Matemàtiques	3	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1400 - Degree in Computer Engineering	Software engineering and project management	COMPULSORY
1936 - Double Degree Program in Mathematics-Telematics Engineering	Tercer curso	COMPULSORY

COORDINATION

PANACH NAVARRETE JOSE IGNACIO

SUMMARY

This is a second year course in Computer Science which takes place in the first semester. The aim of this course is to provide an overview of computer-interaction systems, from a dual perspective.

On the one hand, elements related to interactive systems are studied from a computer perspective; starting from the lowest level, i.e., the operating system and elements that allow one to create interactive applications, to the highest level such as programming tools for graphical user interfaces.

Besides we will address interaction systems from a human side point of view in order to study the factors that have to be considered in the development of interfaces. Also we will focus on how to

develop user interfaces according to usability and accessibility criteria. At the end of the course the student should be able to design, develop and evaluate simple user interfaces.

The overall goals of this course are:

- To introduce students to the concepts of human-computer interaction, emphasizing the importance of user-centered design, the techniques used in interface design, and their evaluation.
- To provide students with the concepts of windowing and event-based programming.
- To teach students to develop graphical user interfaces using programming libraries.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

It is recommended to have attended first year courses on Computer and Programming. This course assumes that students have acquired the programming skills taught in first year courses.

COMPETENCES / LEARNING OUTCOMES

1400 - Degree in Computer Engineering

G3 - Ability to design, develop, evaluate and ensure the accessibility, ergonomics, usability and security of computer systems, services and applications, and of the information that these manage.

G9 - Ability to solve problems with initiative, decision making, autonomy and creativity. Ability to communicate and transmit the knowledge, skills and abilities of a computer engineer.

R17 - Ability to design and evaluate human-computer interfaces that guarantee accessibility and usability of computer systems, services and applications.

R1 - Ability to design, develop, select and evaluate computer applications and systems while ensuring their reliability, safety and quality, according to ethical principles and current legislation and regulations.

R8 - Ability to analyse, design, build and maintain applications in a robust, secure and efficient manner by choosing the most suitable paradigm and programming languages.

TI2 - Ability to select, design, implement, integrate, evaluate, build, manage, exploit and maintain hardware, software and network technologies, within adequate cost and quality thresholds.

TI3 - Ability to use user-centred and organisation-centred methodologies for the development, assessment and management of IT-based applications and systems, to ensure accessibility, ergonomics and usability.

DESCRIPTION OF CONTENTS

1. Introduction to human-computer interaction
Definition
Historical evolution of Interfaces

2. Architecture of interactive systems.
Windowing Systems
Model-View-Controller Architecture
Event-based programming

3. Concepts for Programming users interfaces
Object-Oriented Architecture for graphical interfaces
Tools for the development of user interfaces

4. Programming Graphical user interfaces with Java
Java Foundation Classes
AWT
Java 2D
Java Swing

5. Concepts of human-computer interaction
The humans
The computer
The interaction

6. Design of user-centered computer interfaces
Accessibility
Usability
Evaluation of Interfaces

7. Styles and interaction paradigms
Interaction Styles
Paradigm Styles

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Laboratory	20,00
Classroom practices	10,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	9,00
Independent study and work	13,00
Preparation of lessons	49,00
Preparation for assessment activities	10,00
Resolution of case studies	9,00
Total hours	**90,00**

TEACHING METHODOLOGY

LECTURES:

The lectures will be based on active lectures where every 20/25 minutes will be introduced in any activity that requires the involvement of students, so that 1) they can do an activity based on the content they have just learnt, 2) recover the level of attention to the next block.

LECTURES PREPARATION:

Students have to prepare the lecture content, following the plan of the course. To do this they will use the literature suggested by the lecturer as well as the materials provided him or/and any other directions provided by the lecturer.

PREPARATION OF PRACTICAL WORK:

To better assimilate the contents of the lectures, practical sessions are conducted in the laboratories. Attendance to practical sessions is mandatory and will be verified by the lecturer in charge of the group. Students who are working and can not attend the practical sessions should contact the lecturer before the beginning of the first session. The results of these activities must be submitted to the lecturer in charge of the group during the course and in the terms established by the lecturer. Students are expected to do/prepare some of these activities at home.

TEAM WORK:

A set of problems will be propossed that should be solved in teams of 3 to 6 persons. Each member of the group will be graded both the joint mark of the group as the individual mark from each member.

The e-learning platform (Aula Virtual) will be used as communication tool between the lecturer and the student. The student will access to all the material used in the lectures, through Aula Virtual, as well as all the problems and exercise that needs to solve.

EVALUATION

The evaluation of the course will be carried out through:

(C) Continuous assessment, based on participation and level of involvement in the teaching-learning process, taking into account regular attendance at the scheduled in-person activities and the completion of assignments. As part of the continuous assessment, students will individually complete a set of practical exercise sheets or theoretical development tasks, which must be submitted through the virtual classroom within the established deadline. In addition, two multiple-choice tests or short-answer quizzes will be conducted on part of the course content. All these activities will contribute to the continuous assessment grade as follows:

C (Continuous Assessment Grade) = 0.5 * Tests + 0.5 * Exercise Sheets

Assignments submitted after the deadline will not be considered, and missed activities cannot be retaken. Any form of cheating in these activities will be strictly penalized, resulting in the cancellation of all continuous assessment grades.

(AP) Practical activities, consisting of a group project involving the development of a theoretical work and the creation of a poster, which will be publicly presented by all students. In addition, a group presentation will be carried out to publicly present the results.

AP (Practical Activities) = 0.5 * Poster + 0.5 * Presentation

(E) Individual objective assessments, consisting of one or more exams or knowledge tests, including both theoretical-practical questions and problem-solving tasks. It will be necessary to pass each of these exams in order to pass the course.

(L) Laboratory, consisting of mandatory attendance sessions in which two types of tasks will be carried out: guided practices (Practices 1 to 4) and the development of a final project (Practice 5). Both activities are mandatory and may be completed individually or in pairs. The grade for the guided practices will be the average of Practices 1, 2, 3, and 4. The final project must be individually defended through an oral exam. The grade for this section will be calculated as follows:

L (Laboratory Grade) = average (average (guided practices), project)

A minimum grade of 5 must be obtained in the project and an average grade of at least 5 in the guided practices. Otherwise, the laboratory grade (L) will be the lower of the project grade and the average of the assessments carried out during the sessions:

L (Laboratory Grade) = minimum (average (guided practices), project)

If all individual objective assessments in section E are passed and a grade of at least 5 is obtained in the laboratory section (L), the final grade of the course will be calculated as follows:

Final Grade = 0.15 * C + 0.2 * AP + 0.35 * E + 0.3 * L

If E or L is not passed with a grade of at least 5 and the student has taken the E exam, the final recorded grade will be:

Final Grade = minimum (E, L, 4)

If the student does not take E, the final grade will be "Not Presented".

In the second assessment period, the grades for continuous assessment (C), practical activities (AP), and any passed parts (E and L) will be retained. For the parts not passed (E and L), an exam will be held, and the final grade will be calculated in the same way as in the first assessment period.

Any clear case of cheating or plagiarism in any assessment activity will result in failure of the course and will be subject to the appropriate disciplinary procedures as established in the PROTOCOL FOR ACTION AGAINST FRAUDULENT PRACTICES AT THE UNIVERSITY OF VALENCIA (ACGUV 123/2020).

In all cases, course evaluation will follow the Regulations on Evaluation and Grading of the University of Valencia for undergraduate and master's degrees, approved by the Governing Council on May 30, 2017 (ACGUV 108/2017).

Students may not request an early examination session if they have not previously enrolled in the course.

REFERENCES

- Dix, A., Finlay, J., Abowd, G., & Beale, R. (2004). Human-computer interaction (2nd ed.). Prentice Hall.
- Olsen, D. R. (2010). Building interactive systems: Principles for human-computer interaction. Course Technology.
- Shneiderman, B., Plaisant, C., Cohen, M., Jacobs, S., Elmqvist, N., & Diakopoulos, N. (2016). Designing the user interface: Strategies for effective human-computer interaction (6th ed.). Pearson.
- Niemeyer, P., & Knudsen, J. (2013). Learning Java (4th ed.). O'Reilly Media.
- Knudsen, J. (1999). Java 2D graphics. O'Reilly Media.
- Deitel, P., & Deitel, H. (2018). Java: How to program (11th ed.). Pearson.
- Preece, J., Rogers, Y., & Sharp, H. (2019). Interaction design: Beyond human-computer interaction (5th ed.). Wiley.
- Spolsky, J. (2001). User interface design for programmers. Apress.
- Lazar, J., Goldstein, D. F., & Taylor, A. (2015). Ensuring digital accessibility through process and policy. Morgan Kaufmann.
- Levenick, J. (2009). Simply Java: An introduction to Java programming. Course Technology PTR.
- Kurniawan, B. (2010). Java: A beginner's tutorial. Brainy Software.
- Arnow, D., & Weiss, G. (2011). Introduction to programming using Java: An object-oriented approach. Pearson.
- Horstmann, C. S. (2021). Core Java, Volume I: Fundamentals (12th ed.). Pearson.

- Horstmann, C. S. (2021). Core Java, Volume II: Advanced features (12th ed.). Pearson.
- Sierra, K., & Bates, B. (2022). Head First Java (3rd ed.). O'Reilly Media.
- Urma, R.-G., Fusco, M., & Mycroft, A. (2019). Modern Java in action (2nd ed.). Manning.
- Norman, D. A. (2013). The design of everyday things (Revised and expanded ed.). Basic Books.
- Cooper, A., Reimann, R., Cronin, D., & Noessel, C. (2014). About face: The essentials of interaction design (4th ed.). Wiley.