COURSE DATA

DATA SUBJECT

Code: 34839
Name: Human computer interaction
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1407 - Degree in Multimedia Engineering	Escola Tècnica Superior d'Enginyeria	2	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1407 - Degree in Multimedia Engineering	Desarrollo del Software Multimedia	COMPULSORY

COORDINATION

DURA MARTINEZ ESTHER

SUMMARY

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

On one hand we will study the elements related to interactive systems from a computer perspective; starting from the lowest level, ie, the operating system and elements that allow you 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:

1)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.

2)To provide students with the concepts of windowing and event-based programming.

3) 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

1405 -

B4 - Have basic skills in the use and programming of computers, operating systems, databases and computer software for use in engineering.

B5- Know the structure, organisation, operation and interconnection of computer systems, the fundamentals of their programming and their application to solve engineering problems.

I10 - e able to design and evaluate human-computer interfaces that ensure accessibility and usability of computer systems, services and applications.

MM14 - Be able to create multimedia contents for production environments in broadcasting and digital edition.

MM21 - Communicate effectively, both in writing and verbally, knowledge, procedures, results and ideas related to ICT and specifically to multimedia, and know their socioeconomic impact.

MM23 - Make proper use of theories, procedures and tools in the professional development of multimedia engineering in a real context (specification, design, implementation, deployment and evaluation of multimedia systems solutions).

MM24 - Be able to design, develop, evaluate and ensure the accessibility, ergonomics, usability and security of multimedia systems, services and applications and of the information that these manage.

MM28 - Be able to solve problems with initiative, decision-making and creativity and to communicate and transmit the knowledge, abilities and skills of a multimedia engineer.

MM3 - Be able to implement methodologies, technologies, processes and tools for the professional development of multimedia products in a real context of use by applying the appropriate solutions for each environment.

MM5 - Know how to apply the theoretical and practical resources to deal with a multimedia application as a whole.

MM9 - Program correctly in the different specific languages of multimedia systems taking into account time and cost restrictions.

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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.
Java 2D
Java Swing

5. Concepts of human-computer interaction

The humans

The computer

The interaction

6. Styles and interaction paradigms

Interaction Styles

Paradigm Styles

7. Design of user-centered computer interfaces

Accessibility

Usability

Evaluation of Interfaces

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. It is considered that a student has assisted to all the compulsory sessions if he or she attends a minium of the 80% of the laboratory sessions. The student also has to justify why he he/she could not attend as long as there is a major reason. Students who are working and cannot attend 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 of each member.

The e-learnig 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 assessment of the course will be carried out through:

(C) Continuous assessment, based on participation and level of engagement in the teaching-learning process, taking into account regular attendance at the scheduled face-to-face activities and the completion of assigned tasks. As part of the continuous assessment, students will individually complete a series of practical exercises or theoretical assignments, which must be submitted via the virtual classroom within the established deadline. Additionally, there will be one or two tests in the form of multiple-choice or short-answer questions covering parts of the course content. A group project will be carried out, consisting of the development of a theoretical paper and the creation of a poster, which will be publicly presented by all students. Finally, a group presentation will be conducted to publicly share the results.

All these activities will contribute to the continuous assessment grade as follows:
C (Continuous Assessment Grade) = 0.25 * Tests + 0.3 * Assignments + 0.2 * Poster + 0.25 * Presentation

Tasks submitted after the deadline will not be considered, nor will there be any opportunity to make up missed activities.

(E) Individual objective tests, consisting of one or more exams or knowledge assessments, which will include both theoretical-practical questions and problem-solving tasks. Each of these exams or tests must be passed in order to pass the course.

(P) Practical assessment. Attendance at practical sessions is mandatory. Two types of tasks will be completed during these sessions: practical exercises and the development of a final project. Both tasks are compulsory and can be done individually or in pairs. The practical activities will be assessed based on the submitted code and its functionality. The final project must be defended individually through an oral exam specifically designed for this purpose.

The grade for this component will be calculated as follows:
P (Practical Grade) = average(average(practical tests), project)

A minimum grade of 5 in the project and an average grade of 5 or higher in the tests conducted during the sessions are required to pass this component. Otherwise, the practical grade (P) will be the lower of the project grade and the average grade of the in-session tests:
P (Practical Grade) = minimum(tests, project)

If all individual objective tests in section E have been passed and the practical component (P) has a grade of 5 or higher, the final grade for the course will be calculated as:
Final Grade = 0.35 * C + 0.35 * E + 0.3 * P

If any of the components have not been passed, the final recorded grade will be:
Final Grade = minimum(E, P)

In the second examination session, the continuous assessment grade (C) will be retained (except for the assignments, which can be retaken), as well as the grades for components (E and P) that have been passed. An exam will be held for the components not passed (E and/or P), and the final grade will be calculated in the same way as in the first session.

Regarding fraudulent activity:

- The instructor may expel a student from the exam room if:
    - The student fails to follow procedures that ensure the authenticity and privacy of the exam.
    - There is evidence of impersonation.
    - The student possesses a mobile phone or any other unauthorized electronic device or document.

- The instructor may confiscate the materials involved in incidents during an exam and report the matter in writing to the school administration.

- The instructor may assign a grade of "zero" for an assessment if:

  - There is evidence of fraudulent behavior in part or all of the exam.

  - The student has a mobile phone or any other unauthorized electronic device or document.

- In addition to these measures, the instructor may initiate disciplinary proceedings against the student.

Copying or plagiarism of any activity that is part of the evaluation will result in the impossibility of passing the course, and the student will then be subject to the appropriate disciplinary procedures indicated in the ACTION PROTOCOL FOR FRAUDULENT PRACTICES AT THE UNIVERSITY OF VALENCIA (ACGUV 123/2020).

In any case, the evaluation of this subject will be done in compliance with the University Regulations in this regard, approved by the Governing Council on 30th May 2017 (ACGUV 108/2017)

REFERENCES

- Apuntes y transparencias de la asignatura

- Building Interactive Systems. Principles for Human-Computer Interaction. Dan R. Olsen. 2010

- Learning Java. P. Niemyer, J. Knudsen. OReilly Media, Inc. Third Edition, 2005. Accesible online en Safari Books Online http://proquest.safaribooksonline.com/book/programming/java/9780980839609

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- Human-Computer Interaction. 2nd Ed. A. Dix, J. Finlay, G. Avowd, R.Beale. Prentice-Hall

- Interaction design: Beyond Human-Computer Interaction. J. Preece, Y. Rogers, H. Sharp. J. Willey.

- User Interface Design for Programmers. J. Spolsky. Apress

- Universal Usability. Designing computer interfaces for diverse users. Jonathan Lazar.

- Simply Java: An introduction to Java Programming. J. Levenick. Course Technology PTR. Accesible online en Safari Books Online http://proquest.safaribooksonline. com/book/programming/java/9781584504269

- Java: A Beginners Tutorial. Budi Kurniawan. Brainy Software. 2010. Accesible online en Safari Books Online http://proquest.safaribooksonline.com/bo ok/programming/java/9780980839609