VNIVERSITAT DE VALÈNCIA

Course Guide
34660 Human Computer Interaction

COURSE DATA

Data Subject	
Code	34660
Name	Human Computer Interaction
Cycle	Grade
ECTS Credits	6.0
Academic year	2020 - 2021

Study (s)

Degree	Center	Acad. year	Period
1400 - Degree in Computer Engineering	School of Engineering	2	First term

Subject-matter

Degree	Subject-matter	Character
1400 - Degree in Computer Engineering	7 - Software engineering and project management	Obligatory

Coordination

Name	Department
PANACH NAVARRETE, JOSE IGNACIO	240 - Computer Science

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:

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.

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

LEARNING OUTCOMES

This course aims to achieve the following learning outcomes:

1. To develop graphical user interfaces.
2. To apply techniques to evaluate interfaces.
3. To identify usability issues for interfaces.
4. Demonstrate knowledge of techniques for assessing accessibility.
5. To be able to design interfaces centered on user.

To complement these outcomes, this course also aims that students acquire the following technical and social skills:

-Apply the techniques of user interface design by following the recommended steps in the methodology of interface development as well as involving users in the early stages of the process as necessary.

-Analyze, design interfaces and prototype them
-Demonstrate knowledge of applying various techniques to evaluate interfaces.

-Demonstrate knowledge and use fluently a development tool for graphical user interfaces.
-Understand and apply the techniques of event-driven programming to create interactive applications.
-Be able to communicate effectively both written and oral knowledge related to different stages of design and development of user interfaces.
-Solve problems related to user interface design with initiative, making decisions, in an autonomous and creativity way.
-Teamwork: cooperate, interact, and share the work with other students to solve problems.

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

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Laboratory practices	20,00	100
Classroom practices	10,00	100
Development of group work	3,00	0
Development of individual work	6,00	0
Study and independent work	12,00	0
Readings supplementary material	1,00	0
Preparation of evaluation activities	10,00	0
Preparing lectures	14,00	0
Preparation of practical classes and problem	35,00	0
Resolution of case studies	9,00	0
TOTAL	**150,00**	

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

For the evaluation of the course the following aspects will be considered.
(C) Continuous assessment, based on participation and the degree of involvement of the student on the teaching-learning process. The attendance on regular basis to on-campus lectures/activities and the realization of the work, will be taken into account. Continuous assessment activities include individual theoretical or practical assignments which will be hand in to the lecturer in “Aula Virtual”. It will also include two written tests: multiple choice or short-answer questions to evaluate some part of the content of this course. There will be a group activity where students will have to develop a written theoretical work and to do an oral poster presentation of this work. Finally, a public presentation in group will de done to spread the results publically.
All these activities will lead to the continuous assessment mark as follows:
C (Note Continuous Assessment) = 0.25 *Indivual-Test +0.3 * Assigments + 0.2 * Poster+ 0.25*Presentation.

Assigments hand in after the due date will be rejected. Also these assigments can not be hand in again for the second summon. The copy of any of the assigments will be penalized by cancelling all the marks of the continous assessment activities.

(E) There will be a final individual test consisting of one or more written exams or test of knowledge. These tests will have both theoretical questions and practical problems. It will be mandatory to pass each test to compensate with the other parts and pass the course.
(P) Assessment of laboratory activities. It is mandatory to attend the laboratory sessions. There will be two types of activities in the laboratory sessions: practical activities and the development of a project. Both types of activities are mandatory and can be done in a group made of two persons or individually. The practical activities will be evaluated by an oral or written exam which will include questions regarding the current session and the previous one. The project will be defended individually to the lecturer. The mark for this part will be calculated as follows:
P(Laboratory assessment)=maximum(average(practical activities-tests),final-project)
It is mandatory to get a mark of 5 in both parts, practical activities and final project to compensate with the other parts and to pass the course. In case the student fails any of these parts the mark for the laboratory will be calculated as: minimum (practical activities, final project)
If the student gets a mark equal or higher than 5 for all the tests of knowledge in (E) and if he/she gets a mark equal or higher than 5 for the laboratory part (P) the final mark of the course will be calculated in the following way:
Final Grade=0,35*C+0,35*E+0,3*P
When E o P are not passed with a mark higher to 5 and the students have done the test E, the final mark is

calculated as:
Final Grade=Minimum(E,P,4)
When the test E is not done, the final mark is Non-Presented

In the second summons will be kept note of the continuous assessment (C) (except for Assignments, which can be recovered) and parts (E and P) approved. For unapproved parts (E and P) will be an exam, calculating the final mark as you would at first call.

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)

Students will not be allowed to request for an advance call If they have not registered for the course previously.

Any copy among students detected in the continuous assessment (C), in the final test (E) or in the laboratory assessment (P) involves loosing the matriculation of first and second call in the current course.

REFERENCES

Basic

- Apuntes y transparencias de la asignatura.
- Building Interactive Systems. Principles for Human-Computer Interaction. Dan R. Olsen. 2010.
- Diseño de interfaces de usuario. B. Shneiderman,C. Plaisant. Pearson Addison-Wesley.
- Learning Java. P. Niemyer, J. Knudsen. OReilly Media, Inc. Third Edition, 2005.
- Java 2D Graphics. Jonathan Knudsen. OReilly Media, Inc. 1999.
- Como Programar en Java, Paul Deitel, Pearson.

Additional

- 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.
- Java: A Beginners Tutorial. Budi Kurniawan. Brainy Software. 2010.
- Introducción a la programación con Java, Un enfoque orientado a Objetos, David Arnow, Gerarl Weiss, Addison Wesley

- Core Java. Volume 1, Fundamentals / Cay S. Horstmann, Gary Cornell, N.J. : Prentice Hall/Sun Microsystems Press, 2007
- Core Java, Volume II--Advanced Features, 8th Edition, Cay S. Horstmann, Gary Cornell, , Published Apr 8, 2008 by Pretince Hall.

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

The teaching method for this subject will follow the teaching model approved by the Academic Committee of the GII / GIM degrees (https://go.uv.es/catinfmult/ModeloDocenciaGIIGIM). If facilities are closed because of COVID-19, lectures will be replaced by synchronous sessions that will run according to the degree timetable, using the tools provided by the university.

The weights for each activity will remain the same as specified in the teaching guide.