ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL
Faculty of Electrical and Computer Engineering
COURSE SYLLABUS
Human Computer Interaction

1. CODE AND NUMBER OF CREDITS

CODE	FIEC01545	
NUMBER OF CREDITS: 4	**Theoretical: 4**	**Practical: 0**

2. COURSE DESCRIPTION

This course introduces fundamental principles of interaction design for systems used by humans but mediated by computers or other technological devices. The course focuses on user centered design techniques, prototyping, and evaluation and explores the differences in the interaction design development cycle compared with traditional software development models. The course also explores technologies that enable several interaction paradigms such as ubiquitous computing, virtual reality, augmented reality, brain-computer interaction, among others. Finally, human cognitive skills and limitations are also studied in order to understand the rationale behind guides, principles and rules used for interaction design and accessibility. This course assumes that students already have developed programming skills and that they can learn new APIs, SDKs, and languages in order to solve problems. The course is usually taken within the last three semesters of the program.

3. PRE-REQUISITES AND CO-REQUISITES

PRE-REQUISITES	FIEC03046 SOFTWARE ENGINEERING I
CO-REQUISITES	

4. CORE TEXT AND OTHER REQUIRED REFERENCES FOR THE TEACHING OF THE COURSE

CORE TEXT	1. INTERACTION DESIGN (ID). 3rd Edition Preece Jenny, Rogers Ivonne, Sharp Helen. John Wiley & Sons, 2011. 2. USER INTERFACE DESIGN AND EVALUATIONStone Debbie, Jarrett Carolina, Woodroffe Mark & Minocha Shailey. Morgan Kauffman Publishers 2005
REFERENCES	1. DESIGNING WEB USABILITY. Jakob Nielsen New Riders. Publishing,2000 2. DON'T MAKE ME THINK. Steve Krug. New Riders Publishing. 2000 3. The Design of Everyday Things. Norman D. 2002. Editorial Basic Books. First edition.

5. COURSE LEARNING OUTCOMES

At the end of the course, the student will be able to:

1. Apply human computer interaction concepts to systems design in order to satisfy human needs in a more effective and usable way through the use of computer devices.
2. Design user centered applications considering technology within the context of different user profiles and needs, and task and environment constrains
3. Identify key issues, advantages and disadvantages of the interaction design related to humans and current technologies.
4. Communicate more effectively with stakeholders in a human interaction project

6. COURSE PROGRAM

I. INTRODUCTION TO HCI (2 sessions, 4 hours)
- Importance and evolution of HCI
- Differences between HCI and interface design
- Software quality and usability
- Software design and interaction design

II. MENTAL MODELS AND CONCEPTUAL MODEL (3 sessions, 6 hours)
- Mental Models
- Conceptual model and system image
- Gulf of execution and gulf of evaluation

- Metaphors
- Principles, guidelines and rules

III. UCD: USER CENTERED DESIGN (3 sessions, 6 hours)
- Basic elements of UCD
- Models for interaction design
- Steps for UCD
- User and need identification
- Requirements specifications

IV. PROTOTYPING (3 sessions, 6 hours)
- Characteristics of a prototype
- Lo-fi and Hi-fi prototypes
- Prototyping techniques
- Prototyping tools

V. HUMAN PART OF THE INTERACTION (3 sessions, 6 hours)
- Cognition
- Perception
- Attention handling
- Memory and significance

VI. HELP AND ACCESABILITY (2 sessions, 4 hours)
- Breakdowns and cognitive aids
- Error engineering
- Help design
- Accessibility

VII. COMMUNICATION AND CSCW (2 sessions, 4 hours)
- Communication and technology
- Productivity and CSCW systems
- Groupware
- Social Networks and Social Media

VIII. EVALUATION (2 sessions, 4 hours)
- Evaluation paradigms and techniques
- User observation
- Interviews and surveys
- Inspections and walkthroughs
- User modeling

IX. HCI TECHNOLOGIES (3 sessions, 6 hours)
- GUI and traditional interaction styles
- Tangible interfaces
- Gesture based interfaces
- Immersive environments
- Augmented reality

X. HCI PARADIGMS (3 sessions, 6 hours)
- WIMP (desktop)
- Ubiquitous or pervasive computing
- Wearable computing
- Virtual Reality
- Brain-computer interaction

XI. HCI SPECIAL TOPICS (2 sessions, 4 hours)
- Experience design
- Affective computing
- Perceptual systems and ambience intelligence
- High bandwidth interaction
- Multimodal interfaces

7. WORKLOAD: THEORY/PRACTICE

Two sessions per week, 2 hours per session.

8. CONTRIBUTION OF THE COURSE TO THE EDUCATION OF THE STUDENT

Students explore current human computer interaction paradigms such as ubiquitous computing, tangible interfaces, and augmented reality, among others.
Students also review and apply user centered software design models as well as guides and principles for application development that consider the human side of human computer interaction. They are exposed to the differences and similarities between the HCI development cycle and traditional software engineering methodologies. Students also implement prototypes for the solution to a real need/problem and apply usability testing based in metrics. Students also learn to write a report of their design and results.

BASIC TRAINING	PROFESSIONAL TRAINING	SOCIAL SKILLS DEVELOPMENT
	x	

9. THE RELATIONSHIP BETWEEN THE LEARNING OUTCOMES OF THE COURSE AND THE LEARNING OUTCOMES OF THE DEGREE PROGRAM

LEARNING OUTCOMES OF THE DEGREE PROGRAM*	CONTRIBUTION (High, Medium, Low)	LEARNING OUTCOMES OF THE COURSE**	THE STUDENT MUST:
a. An ability to apply knowledge of computing and mathematics appropriate to the discipline	----		
b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution	Medium	1,3	Use a user centered design approach to analyze, propose and define the requirements for a course project as well as the development guides and principles
c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs	High	1,2,3	Design and implement a viable software/hardware prototype for the project according to the requirements established always following a user-centered approach.
d. An ability to function effectively on teams to accomplish a common goal	High	2,4	Work on a project as part of a team
e. An understanding of professional, ethical, legal, security and social issues and responsibilities	Medium	1,2,3,4	Consider ethical, legal and social conditions through the complete development cycle of the project
f. An ability to communicate effectively with a range of audiences	High	4	Interact with the stakeholders involved in the project proposed. Write a report describing the analysis and design of the project.
g. An ability to analyze the local and global impact of computing on individuals, organizations, and society	Medium	1,2,3,4	Consider the local impact of their activities, when designing and analyzing their project
h. Recognition of the need for and an ability to engage in continuing professional development	Medium	2	Learn the languages, and tools required to complete the course project, and consequently, reflect on the need to keep improving their skills.
i. (An ability to use current techniques, skills, and tools necessary for computing practice.	------		
j. Ability to lead, manage and undertake projects.	------		

10. EVALUATION IN THE COURSE

Evaluation activities	
Exams	X
Tests	X
Homework/tasks	X
Projects	X
Laboratory/Experiments	
Class participation	X
Visits	
Other	

11. PERSON RESPONSIBLE FOR THE CREATION OF THE SYLLABUS AND THE DATE OF ITS CREATION

Created by	Guido Caicedo Rossi
Date	May, 2013

12. APPROVAL

ACADEMIC SECRETARY OF THE ACADEMIC DEPARTMENT	DIRECTOR OF TECHNICAL ACADEMIC SECRETARY
NAME: Sra. Leonor Caicedo G.	NAME: Ing. Marcos Mendoza V.
SIGNATURE:	SIGNATURE:
Date of approval by the Directive Council: 2013-334 2013-08-12	

ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL
Ing. Marcos Mendoza V.
DIRECTOR DE LA SECRETARIA TÉCNICA ACADÉMICA

13. VALIDITY OF THE SYLLABUS

RESOLUTION OF THE POLYTECHNIC BOARD:	13-10-269
DATE:	2013-10-17