



ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL
Faculty of Electrical and Computer Engineering
COURSE SYLLABUS
Computers and Society

1. CODE AND NUMBER OF CREDITS

CODE	FIEC06411	
NUMBER OF CREDITS: 4	Theoretical: 4	Practical: 0

2. COURSE DESCRIPTION

This course outlines the history of computing and the basics of hardware and software of a computer system. It is an introduction to computer science and its different fields of study. In this course students review the ethical and social implications of computer science. It covers the impact of information systems on the individual, society and organizations, in addition to the responsibility of professionals in this branch of study in the proper use of emerging technologies.

3. PRE-REQUISITES AND CO-REQUISITES

PRE-REQUISITES	
CO-REQUISITES	

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

CORE TEXT	1. Nell Dale & John Lewis, Computer Science Illuminated, 5th Ed, 2012, Jones and Bartlett 2. Web sites: Center for Democracy and Technology (www.cdt.org) Electronic Frontier Foundation (www.aclu.org) Computer Professionals for Social Responsibility(http://cpsr.org/) Electronic Privacy Information Center (http://epic.org/) World Intellectual Property Organization (www.wipo.org) IEEE (www.ieee.org) Association for Computer Machinery (www.acm.org)
REFERENCES	1. Deborah Morley & Charles S. Parker, Understanding Computers: Today and Tomorrow, 14th Ed, 2012, Cengage Learning 2. Terrell Ward Bynum, Simon Rogerson, Computer Ethics and Professional Responsibility, Wiley-Blackwell, 2003 3. David Reed, A Balanced Introduction to Computer Science, 3/E, Pearson Prentice Hall, 2010 4. Hester D.M. and Ford P.J., (2001), Computers and Ethics in the Cyberage, Prentice Hall. ISBN 0-13-082978-1. 5. Alberto Prieto-Lloris, Introducción a la Informática, 4ta Edición, Mc Graw Hill, 2006.

5. COURSE LEARNING OUTCOMES

- At the end of the course students will be able to:
1. Explain the activities of their profession, classified by area of specialty, and differentiating their affinity for computer science or computer engineering.
 2. Summarize the significant trends in the history of computing.
 3. Explain the basics of their profession, including the various hardware and software components of a computer system.
 4. Discuss the different ways in which information technology can be applied to solve real problems of society.
 5. Criticize important aspects of the impact of computing on individuals, organizations and society, recognizing the ethical, social and professional role of the computer scientist.
 6. Understand the concepts of intellectual property and how it applies to information systems and their profession.
 7. Recognize the need to be prepared for continuous professional development.



6. COURSE PROGRAM

- I. Summary and Introduction (1 class session - 1 hour)
- Course Content
 - Course Policies
 - Relevance of this course
- II. Computers: Basic Functions and Computing Devices (4 class sessions - 8 hours)
- Data, Information, Computing and Informatics
 - Computer and Software Systems
 - Types of Computers and Their Applications
- III. The History of Computing (1 class session - 2 hours)
- The World before 1946
 - The Vacuum Tube Era
 - The Semiconductor Era
 - The Integrated Circuit Era
 - The PC Revolution
 - The Internet Revolution
- IV. Data Representation (3 class sessions - 6 hours).
- Analog vs Digital
 - Binary Numbers and Units of Information
 - Numeral Systems
 - Representing Integer Numbers
 - Representing Real Numbers
 - Representing Text
 - Representing other Data Types
 - Representing Multimedia Data
 - How the computer distinguishes between Data Types
- V. Von Neumann Architecture (3 class sessions - 6 hours).
- Inside a CPU: CPU Subunits
 - CPU and Main Memory
 - Stored-program Computer
- VI. Programming and Programming Languages (3 class sessions - 6 hours).
- Algorithms and Programming
 - Assembly Language
 - High-Level Programming Languages
 - Program Translation
 - Interpreters and Compilers
- VII. Internet and Networking (4 class sessions - 8 hours).
- Internet History
 - How the Internet works
 - Distributed Networks
 - Internet Protocols and Services
 - Domain Name System
 - History of the Web
 - How the Web Works
- VIII. The Computer Professional (3 class sessions - 5 hours).
- Computer Science
 - Computer Engineering
 - The Employers' point of view vs graduates' expectations
 - Areas of Computer Science
 - Computer Science: Relationship with other Sciences
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- IX. Social Issues within a Knowledge Society (2 class sessions - 3 hours).
- Positive Impact of Technology
 - Potential Risks of Technology
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- X. Intellectual Property and Information Technologies (2 class sessions - 3 hours).
- Intellectual Property Concepts
 - Peer-to-Peer File Sharing and Copyright Infringement
 - DCMA: Digital Millennium Copyright Act



- Software Patents
 - Software Licensing
 - Free Software and Open Source Software
- XI. Privacy, security, civil liberties and legal issues (2 class sessions - 3 hours).
- Security: phishing, certificates
 - Privacy
 - Freedom of Information and Expression
 - Legal and Regulatory Frameworks
- XII. Professional Ethics and Responsibilities (3 class sessions - sesiones - 5 horas).
- Ethical, Conduct and Practice Codes
 - Software Risks

7. WORKLOAD: THEORY/PRACTICE

Based on a 14-week semester classes, each week there are two class session of four hours total.

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

The course provides a basis for further study of the different fields of computer science. This course introduces students to abstraction and analysis skills. It exposes students to professional challenges at local and regional levels, where the social, professional and ethical aspects come into play. It also provides opportunities to develop effective communication skills in Spanish, as a team member. It helps create awareness of the need to acquire and improve skills and technical and scientific knowledge, throughout professional life. The impact of computing on different aspects of contemporary society is also studied.

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	CONTRIBUTIO N (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	Medium	3,4	Recognize that there are multiple scopes of their profession that cannot be isolated. Interact with an employer and peers to strengthen their understanding of professional skills demanded in the labor market. Recognize that international professional bodies such as IEEE, urge their members to continuous professional development. Recognizing the need to know the legal aspects related to their profession
(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution	--		
(c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs	--		
(d) An ability to function effectively on teams to accomplish a common goal	High	4,5,7	Prepare an effective presentation on a topic assigned by the teacher as part of a team. Discuss as part of a group, and



			present results of the analysis of several case studies related to computer-society. Analyze as part of a team a case study where there is an ethical dilemma in the profession, and defend in a panel the group's position
(e) An understanding of professional, ethical, legal, security and social issues and responsibilities.	High	1,3,4,5,6	Analyze the impact of ICT on individuals and society, the dilemmas related to intellectual property, privacy and civil rights to ICT, analyze ethical dilemmas in the professional field. Understand that there is a regulatory framework that affects their work and the use of ICT. Understand and interpret the codes of ethics of the ACM and the IEEE
(f) An ability to communicate effectively with a range of audiences	High	4,5,7	Prepare an effective presentation on a topic assigned by the teacher. Discuss in group several case studies related to computer-society. and defend in a panel the group's position
(g) An ability to analyze the local and global impact of computing on individuals, organizations, and society.	High	2,4,5,6	Analyze the impact of ICT on individuals and society, dilemmas related to intellectual property, privacy and civil rights to ICT, and ethical dilemma in their professional field. Understand that there is a regulatory framework that affects the use of ICTs
(h) Recognition of the need for and an ability to engage in continuing professional development.	High	7	Recognize that there are multiple scopes of their profession that cannot be isolated. Interact with an employer and peers to strengthen their understanding of professional skills demanded in the labor market. Recognize that international professional bodies such as IEEE, urge their members to continuous professional development. Recognizing the need to know the legal aspects related to their profession
(i) An ability to use current techniques, skills, and tools necessary for computing practice.	Medium	3,4	Expressing through algorithms the solution to a simple problem. Efficiently use a search engine such as Google and Google Scholar. To become familiar with the use of a digital library. Develop a small basic website
(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	x

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

Created by	Ing Marisol Villacrés
Date	26 Feb 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:  ESCUOLA SUPERIOR POLITÉCNICA DEL LITORAL
Date of approval by the Directive Council: 2013-334 2013-08-12	Ing. Marcos Mendoza V. DIRECTOR DE LA SECRETARÍA TÉCNICA ACADÉMICA

13. VALIDITY OF THE SYLLABUS

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