

University of Puerto Rico
 Mayagüez Campus
 College of Engineering
 Department of Electrical and Computer Engineering
 Bachelor of Science in Electrical Engineering

Course Syllabus

1. General Information:	
Alpha-numeric codification: ICOM 4215 Course Title: Computer Architecture and Organization Number of credits: 3 Contact Period: 3 hours of lecture per week Required in ICOM and Elective in INEL	
2. Course Description:	
English: Architectural aspects of general purpose computers: instruction sets, addressing modes, data types, registers, support for programming languages and operating systems. Comparative study of commercial architectures. Organizational aspects of general purpose computers: central processing unit, control unit, microprogramming, arithmetic and logic units, memory systems, input/output systems.	
Spanish: Aspectos arquitecturales de computadoras de propósito general: sets de instrucciones, modos de direccionamiento, tipos de datos, registros, apoyo para lenguajes de programación y sistemas operativos. Estudio comparativo de arquitecturas comerciales. Aspectos organizacionales de computadoras de propósito general: unidad central de procesamiento, unidad de control, microprogramación, unidades aritméticas y lógicas, sistemas de memoria, sistemas entrada/salida.	
3. Pre/Co-requisites and other requirements:	
Prerequisite: INEL 4206	
4. Course Objectives:	
The objective is to provide the student with various architectural philosophies in defining hardware and software interface within a computer system. In addition, the student will learn how to design a simple CPU.	
5. Instructional Strategies:	
<input checked="" type="checkbox"/> conference <input checked="" type="checkbox"/> discussion <input type="checkbox"/> computation <input type="checkbox"/> laboratory <input type="checkbox"/> seminar with formal presentation <input type="checkbox"/> seminar without formal presentation <input type="checkbox"/> workshop <input type="checkbox"/> art workshop <input type="checkbox"/> practice <input type="checkbox"/> trip <input type="checkbox"/> thesis <input type="checkbox"/> special problems <input type="checkbox"/> tutoring <input type="checkbox"/> research <input checked="" type="checkbox"/> other, please specify: Team work in software and computer hardware design	
6. Minimum or Required Resources Available:	
Computer labs, high level languages compilers, simulator for digital systems.	
7. Course time frame and thematic outline	
Outline	Contact Hours
1.Introduction to computer architecture	5
2.RISC and CISC architectures	3
3.Contemporary RISC microprocessors	3
4.Data paths	1
5.Control unit	6
6.Microprogramming	3
7.Arithmetic units	3
8.Caches	2
9.Virtual memory	2
10.Project	15
11. Exams	2
Total hours: (equivalent to contact period)	45

8. Grading System Quantifiable (letters) Not Quantifiable**9. Evaluation Strategies** (Suggested): The faculty member teaching the course will provide the student with the evaluation strategy he/she will be using throughout the semester. This will be done within the first week of classes.

	Quantity	Percent
<input checked="" type="checkbox"/> Exams	2	20
<input checked="" type="checkbox"/> Final Exam	1	20
<input type="checkbox"/> Short Quizzes		
<input type="checkbox"/> Oral Reports		
<input type="checkbox"/> Monographies		
<input type="checkbox"/> Portfolio		
<input checked="" type="checkbox"/> Projects	3	60
<input type="checkbox"/> Journals		
<input type="checkbox"/> Other, specify:		
TOTAL:		100%

10. Bibliography:Heuring, V.P. and Jordan, H.F., Computer Systems Design and Architecture, 2nd. Ed., Prentice Hall, 2007.**11. According to Law 51**

Students will identify themselves with the Institution and the instructor of the course for purposes of assessment (exams) accommodations. For more information please call the Student with Disabilities Office which is part of the Dean of Students office (Chemistry Building, room 019) at (787)265-3862 or (787)832-4040 extensions 3250 or 3258.

12. Contribution of Course to meeting the requirements of Criterion 5:

Math	Basic Science	General	Engineering Topic
			√

13. Course Outcomes**Map to Program Outcomes**

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| 1. Describe different computer architectures | (a) |
| 2. Compare different computer architectures | (a) |
| 3. Design a computer program to simulate the operation of a simple CPU | (c) |
| 4. Design the hardware for a simple CPU | (c) |
| 5. Represent CPU specifications using RTN or Metalanguages | (k) |
| 6. Use a digital circuits simulator to test a CPU design | (k) |

Person(s) who prepared this description and date of preparations: José Navarro. Submitted by: Isidoro Couvertier, Comité Timón, October 2007.