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## 2nd Semester

### COMPUTER ARCHITECTURE (AIC201) - CS-IS

**Coordinator: *Roumeliotis Manos***

**Semester:** **2nd** (Spring) | **Course type:** **Compulsory CS-IS**  | **Weekly hours:** **3** | **ECTS:** **5**

**Instructors:** *Roumeliotis Manos , Souravlas Stavros*

**General competences**

Computer Architecture deals with the logic design of the basic abstraction layers that facilitate the efficient execution of computer programs, according to current digital circuit technologies, with emphasis on processor and memory operation. Students must be able to explain the organization of a typical computer system, as well as the execution of a simple program on that system. Further, students must be able to design simple digital circuits, program in simple assembly language and estimate the performance of a simple computer system.

**Course content**

Introduction: Structured Computer Organization, Survey of Modern Computer Systems: Processor, Memory, Buses, I/O.

Digital Logic: Information Representation, Logic Gates and Boolean Algebra, Basic Combinatorial Circuits, Basic Sequential Circuits and Memory, Buses.

Microarchietcture: Data Paths and Memory Models, Execution of Instructions and Microisnstructions, Instruction Level Parallelism, Cache Memory, Performance Improvements.

Instruction Set Architecture: Data Types, Instruction Formats, Addressing Modes, Instruction Types, Flow Control, Assembly Language Programming.

**Assessment**

Optional programming assignment up to 2 additional marks

**Course bibliography**

(One of the following):

68374428 Ψηφιακή Σχεδίαση, 2η 'Εκδοση, Τύπος: Σύγγραμμα, Ρουμελιώτης Μάνος, Σουραβλάς Στάυρος, 2017, ΤΖΙΟΛΑ, ISBN: 978-960-418-742-3

94692327 Οργάνωση και Αρχιτεκτονική Υπολογιστών, 11η Έκδοση, Τύπος: Σύγγραμμα, Stallings William, 2020, ΤΖΙΟΛΑ, ISBN: 978-960-418-892-5

15120 Οργάνωση και αρχιτεκτονική ηλεκτρονικών υπολογιστών, Τύπος: Σύγγραμμα, Hammacher Carl,Vranesic Zvonko,Zaky Safwat, 2007, Επίκεντρο, ISBN: 978-960-458-000-2

**Additional material**

(<http://www.etl.uom.gr/mr/index.php?mypage=archit>)