Computer Architecture and Organization

Course Title: Student Development					
Course Code: COM6011	**Student Workload:** 8.50 Hours / Weeks	**Credits:** 3 Credits (4.50 ECTS)	**Semester:** 1st Semester	**Frequency:** Odd Semester	**Duration:** 16 Weeks/ Semester (*Lecture*: 14 weeks; *Midterm assessment*: 1 week; *Final assessment*: 1 week)

1	**Types of Courses:** Information technology Fundamentals	**Contact Hours:** *Lecturing*: 2.50 Hours/ Week; *Practical Work*: 0.00 Hours/ Week	**Independent Study:** *Self-study:* 3.00 Hours/ Week; *Strcutured Assignment*: 3.00 Hours/ Week	**Class Size:** 40 Students
2	**Prerequisites for Participation** (If Applicable)**:** -			
3	**Learning Outcomes:** 1. M1: Students are able to describe the history of the development of computer evolution 2. M2: Students are able to describe the architecture and organization of the processor (CPU) on a computer 3. M3: Students are able to describe the architecture and organization of memory on a computer 4. M4: Students are able to describe the interface of input-output (IO) and other peripherals that exist or are connected to a computer. 5. M5: Students are able to describe the components of a digital system for those on a computer 6. M6: Students are able to describe logical and arithmetic operations performed by computers 7. M7: Students are able to describe the Instruction Set Architecture (ISA) that exists and is used on computers 8. M8: Students are able to describe the multicore architecture on the computer 9. M9: Students are able to describe the distributed system architecture used on computers			
4	**Subject aims/Content:** At the end of the course, students are expected: 1. L1: Students are able to explain the concepts of architecture and organization on computers, including the history of their development 2. L2: Students are able to explain the relationship between architecture and organization on a computer and its performance 3. L3: Students are able to explain the architecture and organization of the processor (CPU) on a computer 4. L4: Students are able to explain about the bus system on a computer 5. L5: Students are able to explain about the architecture and organization of the existing cache memory on the computer 6. L6: Students are able to explain about the architecture and organization of the internal memory on the computer 7. L7: Students are able to explain about the architecture and organization of the external memory on the computer 8. L8: Students are able to explain about the interface of input-output and peripherals that exist or are connected to the computer 9. L9: Students are able to explain the role and workings of the operating system as a resource manager on a computer 10. L10: Students are able to explain about the representation of binary numbers on a computer and how the computer performs the process of logical and arithmetic operations 11. L11: Students are able to explain the Instruction Set Architecture (ISA) in terms of the characteristics and addresses used on computers			

	12. L12: Students are able to explain the characteristics of each Reduced Instruction Set Computer (RISC) and Complex Instruction Set Computer (CISC) used in computers. 13. L13: Students are able to explain about pipeline technology and its development including superpipeline and superscalar used in computers 14. L14: Students are able to explain the working principle of the Control Unit (CU) and its relationship with the micro-programmed control in the processor (CPU) on a computer. 15. L15: Students are able to explain about Multicore and Distributed System in relation to parallel processing carried out by one or several computers
5	**Teaching Methods:** Lecturing, Group Discussion, Case-Based Learning
6	**Assessment Methods:** Essay, portfolio, performance test, peer assessment
7	**This Course is Used in The Following Study Programme/s as Well:** -
8	**Responsibility for Course:** -
9	**Other Information:** Bibliography: 1. William Stallings, "Computer Organization and Architecture Designing for Performance Eighth Edition", Prentice Hall, 2019 2. David A. Patterson, "Computer Organization and Design The Hardware and Software Interface", Elsevier, 2012 3. David A. Patterson, John L. Hennessy. "Computer Architecture: A Quantitative Approach", Elsevier, 2012