UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
ECE-422	Advanced Computer Architecture	6
Prerequisites	**Department**	**Semester**
ECE-111, ECE-421	Engineering	Fall/Spring
Type of Course	**Field**	**Language of Instruction**
Elective	Computer Engineering	English
Level of Course	**Lecturer(s)**	**Year of Study**
1st Cycle	Dr Stelios Neophytou	4th
Mode of Delivery	**Work Placement**	**Corequisites**
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course and discuss advance topics of modern computers systems regarding their organization, microarchitecture and hardware implementation. Specifically, the course will focus on modern architectures implemented in multicores systems, embedded computers and computers for high performance and cloud applications.

Learning Outcomes:

After completion of the course students are expected to be able to:

1. Define computer architecture principles underlying in modern computer systems.
2. Discuss different architecture and hardware solutions embedded systems and systems used for cloud applications.
3. Explain advanced method used for performance optimization and cost reduction.
4. Discuss issues such as power consumption, technology depended design and system level testing.
5. Estimate and compare the performance of a server computers and explain how the performance is affected by their different characteristics.
6. Describe advanced systems infrastructure such as clusters and warehouse computing systems.
7. Describe modern multicore architectures and discuss their characteristics and performance.

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Course Content:

- Data-Level Parallelism in Vector, SIMD, and GPU Architectures
- Parallel Processors from Client and Cloud
- Warehouse-scale computers
- Special purpose Instruction set architectures
- Request-level and Data-level Parallelism in Warehouse-scale computers
- Embedded systems architecture
- Large-scale multiprocessors and scientific computing
- Advanced storage systems

Learning Activities and Teaching Methods:

Lectures, Lab and Homework Assignments, Literature Review, Course Project.

Assessment Methods:

Midterm Exam, Lab Assignments/Homework, Course Project, Final Examination(comprehensive)

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Computer Architecture: A Quantitative Approach	Hennessy J. and Patterson D.	Morgan Kaufmann	2012	978-0-12-383872-8

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Computer Organization and Design. The software/hardware interface	Patterson D. and Hennessy J.	Morgan Kaufmann	2014	978-0-12-407726-3
Computer Organization and Design Fundamentals.	David Tarnoff	Lulu.com	2007	