



## Course Syllabus

<b>Course Code</b>	<b>Course Title</b>	<b>ECTS Credits</b>
COMP-435	Advanced Computer Architecture	6
<b>Prerequisites</b>	<b>Department</b>	<b>Semester</b>
COMP-335	Computer Science	Fall, Spring
<b>Type of Course</b>	<b>Field</b>	<b>Language of Instruction</b>
Elective	Computer Science	English
<b>Level of Course</b>	<b>Lecturer(s)</b>	<b>Year of Study</b>
1 <sup>st</sup> Cycle	Dr Charalambos Christou	4 <sup>th</sup>
<b>Mode of Delivery</b>	<b>Work Placement</b>	<b>Corequisites</b>
Face-to-face	N/A	None

### Course Objectives:

The main objectives of the course are to:

Provide the student with the opportunity to study high-performance and supercomputer architectures used to solve very large-scale problems and computationally intensive applications, which are not realistically solvable on typical computers.

### Learning Outcomes:

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

- Assess parallel computers and scalability
- Compare multiprocessors interconnect (bus systems)
- Assess shared memory and message passing computer
- Compare vector and SIMD computers
- Explain massively parallel processing
- Explain granularity and dependencies
- Apply performance issues; Amdahl's and Gustaffson's laws
- Assess memory systems for parallel processors
- Discuss examples of supercomputers
- Explain software parallelism

**Course Content:**

- Parallel computers and scalability.
- Multiprocessor interconnects and bus systems
- Shared memory and message passing computers.
- Vector and SIMD computers.
- Massively parallel processing.
- Granularity and dependencies.
- Performance issues; Amdahl's and Gustaffson's laws.
- Memory Systems for parallel processors.
- Examples of supercomputers.
- Software parallelism

**Learning Activities and Teaching Methods:**

Lectures, In-class exercises, Directed reading and homework, Learning through the project and project presentations

**Assessment Methods:**

Homework, Quizzes, Mid-Term, Final Exam, Project

**Required Textbooks / Readings:**

Title	Author(s)	Publisher	Year	ISBN
Advanced Computer Architecture: Parallelism. Scalability. Programmability	Kai Hwang	McGraw Hill	2008	ISBN-13: 978-0-07-053070-6 ISBN-10: 0-07-053070-X

**Recommended Textbooks / Readings:**

Title	Author(s)	Publisher	Year	ISBN
Scalable Parallel Computing:	Kai Hwang, Zhiwei Xu	McGraw Hill	1998	ISBN-13: 978-0070317987 ISBN-10: 0070317984

Technology, Architecture, Programming				
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