

Global Learning Semesters

Course Syllabus

Course: CENG-435 Advanced Computer Architectures

Department: Engineering

Host Institution: Intercollege, Nicosia, Cyprus



Course Summary		
Course Code	Course Title	Recommended Credit Hours
CENG-435	Advanced Computer Architectures	3
Semester Offered	Contact Hours	Prerequisites
Please contact us	42-45	CENG-335
Department	Level of Course	Language of Instruction
Engineering	Upper Division	English

Course Description

The goal of this course is 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 microcomputers, workstations or mainframe computers. Topics include the design and performance aspects of parallel computer structures; architectural classifications, memory structures, arithmetic pipelining, and vector processing units; vectorizing concepts, effectiveness, and efficiency; pipelined computers, array processors, multiprocessors systems; bit-sliced architectures, interconnection networks, multiprocessing control and scheduling, parallel algorithms, data flow concepts and implications.

Prerequisites

CENG-335

Topic Areas

1. Parallel computers and scalability.
2. Shared memory and message passing computers.
3. Vector and SIMD computers.
4. Massively parallel processing.
5. Granularity and dependencies.
6. Performance issues; Amdahl's and Gustafson's laws.
7. Architecture review; CISC, RISC, superscalar, VLIW.
8. Memory Systems for parallel processors.
9. Multiprocessor interconnects and bus systems.
10. Examples of supercomputers.
11. Software for parallelism.

Readings and Resources

Required Textbook

- Kai Hwang, Advanced Computer Architecture: Parallelism, Scalability, Programmability, McGraw-Hill, 1993 (ISBN: 0-07-031622-8).