

**PHILADELPHIA UNIVERSITY
FACULTY OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT**

Course Title:	ADVANCED COMPUTER ARCHITECTURE	(630461)
Prerequisite:	Computer Architecture	(630361)
Text Books:	Advanced Computer Architecture, By: K. Hwang, McGraw Hill, 2 nd Edition, 2010, ISBN: 0-07-0702101.	
Instructor:	Prof. Kasim M. Al-Aubidy.	Office No: 703
Email:	qmlone@yahoo.com	Semester: 2 nd (2010-2011)
Time:	(8:15-9:45)	Monday & Wednesday
Office Hours:	(12:10 - 13:00)	Sunday to Thursday

Course Contents

	<u>Weeks</u>
□ RISC Architecture: CISC & RISC Architecture, The use of a large register file, RISC pipelining.	1
□ Parallel computer models: Evolution of computer architecture, Multiprocessors & multicomputers, Vector supercomputers & SIMD supercomputers, VLSI models, Dataflow machines.	2
□ Pipeline Processing: Pipelined logic, Pipeline performance & SIMD parallel processors, Steady-state analysis of pipelines, Arithmetic pipelines, Pipeline instruction processing, Memory systems used in pipelined processors, Pipeline scheduling theory.	3
□ Program behavior & network properties: Conditions of parallelism, Hardware & software parallelism, Program partitioning & scheduling, Program flow mechanisms, System interconnect architectures.	2
□ Principles of scalable performance: Performance metrics & measures, Speedup performance laws, Scalability analysis & approaches,	2
□ Parallel Computer Architectures: Design issues: communication models, interconnection networks, performance. SIMD computers: array processors & vector processors. Shared memory multiprocessors: UMA, NUMA & COMA multiprocessors. Message-passing multicomputers.	4

Grading

1. First exam (15%):	Monday, 4/4/2011
2. Second exam (20%):	Monday, 9/5/2011
3. Quizzes & scientific report (20%):	Thursday, 2/5/2011
4. Final exam (50%):	

References

1. **H. El-Rewini & M. Abd-El-Barr**, "Advanced Computer Architecture and Parallel Processing" J. Wiley, 2005, ISBN: 978-0-471-46740-3
2. **M. R. Bhujade**, "Parallel Computing", New Age Intr. Publishers, India, 1998.
3. **S. Tanenbaum**, "Structured Computer Organization" Prentice Hall, 2007.
4. **W. Stallings**, "Computer Organization & Architecture", Prentice Hall, 2006.
5. **M.M. Mano**, "Computer System Architecture" 4th edition, Prentice Hall, USA 1997. ISBN: 0-13-175738-5.