

<b>Dept Number</b>	<b>CS 401</b>	<b>Course Title</b>	<b>Computer Architecture</b>							
<b>Semester Hours</b>	<b>3</b>	<b>Course Coordinator</b>	<b>Wen-Chi Hou</b>							
<b>Catalog Description</b>	Review of logical circuit design. Hardware description languages. Algorithms for high-speed addition, multiplication and division. Pipelined arithmetic. Implementation and control issues using PLA's and microprogramming control. Cache and main memory design. Input/Output. Introduction to interconnection networks and multiprocessor organization.									
<b>Textbooks</b>										
Computer Architecture Single and Parallel Systems, Mehdi Zargham, Prentice Hall, 1996.										
<b>References</b>										
<b>Course Learning Outcomes</b>										
<ul style="list-style-type: none"> <li>• To understand the concepts in computer organization and architecture.</li> <li>• To learn to design processor, control, memory, and I/O sections.</li> <li>• To learn the basic issues and designs of multiprocessor systems.</li> </ul>										
<b>Assessment of the Contribution to Program Outcomes</b>										
<b>Outcome →</b>	1	2	3	4	5	6	7	8	9	10
<b>Assessed →</b>	X	X	X							
<b>Prerequisites by Topic</b>										
320 with a grade of C or better.										

**Major Topics Covered in the Course**

1. Evolution and taxonomies of Computer Architecture, review of I/O interface {4 classes}
2. Processor design, microprogramming, instruction formats, number representations, design of advance and high speed arithmetic circuits, addition and subtraction, multiplication, division, pipelined arithmetic {10 classes}
3. Memory organization: semiconductor memories, associative memories, cache memories, parallel memories {4 classes}
4. Pipelines: instruction, arithmetic, static and dynamic pipeline designs, structural, data, and control hazards. {12 classes}
5. CISC/RISC features {4 classes}
6. Interconnection networks: non-blocking, blocking, rearrangeable networks {6 classes}
7. Parallel computers: multiprocessors and multicomputers, cache coherence {6 classes}