Great Ideas in Computer Architecture (Machine Structures)

CS 61C at UC Berkeley with Dan Garcia, Peyrin Kao - Fall 2024

Lecture: Monday/Wednesday/Friday 10:00AM - 11:00AM PT, Dwinelle 155
Recordings will be published to bCourses Media Gallery

Week	Date	Lecture	Discussion	Lab	HW	Project
1	Tue 8/27	Lecture 0: Intro, Great Ideas Slides | Videos				
	Wed 8/28	Lecture 1: Number Representation Readings: Course Policies, P&H:2-4, Binary Slides Slides				
	Thu 8/29					
	Fri 8/30	Lecture 2: C Intro - Basics Readings: K&R 1-5, C Reference Slides, Brian Harvey's Intro to C Slides		Lab 0: Intro, Setup Due 9/03		
2	Mon 9/2	No Lecture: Holiday				
	Tue 9/3		Discussion 1: C, Number Rep Worksheet | Solutions | Videos (SP24)		Homework 1 Due 9/06	
	Wed 9/4	Lecture 3: C Intro - Pointers, Arrays, Strings Readings: K&R 5-6 Slides		Lab 1: C Due 9/05		Project 1: snek Due 9/12
	Thu 9/5					
	Fri 9/6	Lecture 4: C Memory Management Readings: K&R 7.8.5, 8.7 Slides | Drive				
3	Mon 9/9	Lecture 5: C Generics Readings: K&R 7.8.5, 8.7 Slides | Drive	Discussion 2: C Worksheet | Solutions | Videos (SP24)			
	Tue 9/10					
	Wed 9/11	Lecture 6: Floating Point Readings: IEEE 754 Simulator Slides | Drive		Lab 2: C Debugging Due 9/11		
	Thu 9/12				Homework 2 Due 9/17	
	Fri 9/13	Lecture 7: RISC-V Basics Readings: P&H 2.1-2.3 Slides | Drive				Project 2: CS61Classify A: Due 9/23 B: Due 10/03
4	Mon 9/16	Lecture 8: RISC-V Data Transfer Readings: P&H 2.9, 2.10 Slides | Drive	Discussion 3: Floating Point / RISC-V Worksheet | Solutions | Videos (SP24)			
	Tue 9/17					
	Wed 9/18	Lecture 9: RISC-V Decision Making Readings: P&H 2.6, 2.7, 3.2 Slides | Drive		Lab 3: RISC-V, Venus Due 9/19	Homework 3 Due 9/24	
	Thu 9/19					

Week	Date	Lecture	Discussion	Lab	HW	Project
	Fri 9/20	Lecture 10: RISC-V Procedures Readings: P&H 2.8 Slides | Drive				
5	Mon 9/23	Lecture 11: RISC-V Instruction Formats I Readings: P&H 2.5, 2.10 Slides | Drive	Discussion 4: RISC-V Calling Convention Worksheet | Solutions | Videos (SP24)			
	Tue 9/24					
	Wed 9/25	Lecture 12: RISC-V Instruction Formats II Readings: P&H 2.5, 2.10 Slides | Drive		Lab 4: RISC-V Calling Convention **Due 9/26**		
	Thu 9/26					
	Fri 9/27	Lecture 13: Compiler, Assembler, Linker, Loader Readings: P&H 2.12 Slides | Drive			Homework 4 **Due 10/01**	
6	Mon 9/30	Lecture 14: Intro to SDS Readings: SDS Handout Slides | Drive	Discussion 5: CALL, RISC-V ISA Worksheet | Solutions | Videos (SP24)			
	Tue 10/1					
	Wed 10/2	Lecture 15: Combinational Logic Readings: Blocks Handout Slides | Drive				
	Thu 10/3					
	Fri 10/4	Lecture 16: State and Registers Readings: P&H A.3-A.6, State Handout Slides | Drive				Project 3: CS61CPU **A: Due 10/24** **B: Due 11/07**
7	Mon 10/7	Lecture 17: Combinational Blocks: MUX and ALU Readings: P&H 4.1, 4.3 Slides | Drive	Discussion 6 Worksheet | Solutions | Videos (SP24)			
	Tue 10/8					
	Wed 10/9	Lecture 18: RISC-V Single-Cycle Datapath I Readings: P&H 4.4 Slides | Drive			Homework 5 **Due 10/15**	
	Thu 10/10					
	Fri 10/11	Lecture 19: RISC-V Single-Cycle Datapath II Slides | Drive				
8	Mon 10/14	Lecture 20: RISC-V Single-Cycle Control (10-11 AM) + Midterm (8-10 PM) Readings: P&H 4.6–4.8 Slides | Drive				
	Tue 10/15					
	Wed 10/16	Lecture 21: RISC-V 5-Stage Pipeline I Readings: P&H 4.8, 4.10 Slides | Drive		Lab 5: Logisim **Due 10/17**	Homework 6 **Due 10/22**	

Week	Date	Lecture	Discussion	Lab	HW	Project
	Thu 10/17					
	Fri 10/18	Lecture 22: RISC-V 5-Stage Pipeline II Readings: P&H 4.6, 4.7, 4.8, 4.10 Slides | Drive				
9	Mon 10/21	Lecture 23: RISC-V 5-Stage Pipeline III Readings: P&H 4.6, 4.7, 4.8, 4.10 Slides | Drive	Discussion 7 Worksheet | Solutions | Videos (SP24)			
	Tue 10/22					
	Wed 10/23	Lecture 24: Caches I Readings: P&H 5.1-5.4, 5.8, 5.9, 5.13, Cache Flowchart Slides | Drive				
	Thu 10/24					
	Fri 10/25	Lecture 25: Caches II Readings: P&H 5.1-5.4, 5.8, 5.9, 5.13, Cache Flowchart Slides | Drive			Homework 7 Due 10/29	
10	Mon 10/28	Lecture 26: Caches III Readings: P&H 5.1-5.4, 5.8, 5.9, 5.13, Cache Flowchart Slides | Drive	Discussion 8: Pipelining, Hazards Worksheet | Solutions | Videos (SP24)			
	Tue 10/29					
	Wed 10/30	Lecture 27: Caches IV Readings: P&H 1.7, 1.8, 2.11, 4.10, 4.11, 5.10, 6.1-6.3, 6.5, 6.7, OpenMP Summary Card Slides | Drive		Lab 6: CPU, Pipelining Due 10/31	Homework 8 Due 11/12	
	Thu 10/31					
	Fri 11/1	Lecture 28: Parallelism I - Intro, Amdahl's Law Readings: P&H 1.7, 1.8, 2.11, 4.10, 4.11, 5.10, 6.1-6.3, 6.5, 6.7, OpenMP Summary Card Slides | Drive				
11	Mon 11/4	Lecture 29: Parallelism II - SIMD Readings: P&H 1.7, 1.8, 2.11, 4.10, 4.11, 5.10, 6.1-6.3, 6.5, 6.7, OpenMP Summary Card Slides | Videos	Discussion 9: Caches, AMAT Worksheet | Solutions | Videos (SP24)			
	Tue 11/5					
	Wed 11/6	Lecture 30: Parallelism III - TLP Readings: P&H 1.7, 1.8, 2.11, 4.10, 4.11, 5.10, 6.1-6.3, 6.5, 6.7, OpenMP Summary Card Slides | Videos				
	Thu 11/7					
	Fri 11/8	Lecture 31: Parallelism IV - Concurrency Slides | Videos				Project 4: CS61kaChow Due 11/21
12	Mon 11/11	No lecture: Holiday				

Week	Date	Lecture	Discussion	Lab	HW	Project
	Tue 11/12		Discussion 10: Caches, SIMD Worksheet | Solutions | Videos (SP24)			
	Wed 11/13	Lecture 32: Parallelism V - Distributed Computing and MapReduce Slides | Drive		Lab 7: Parallelism Due 11/14		
	Thu 11/14					
	Fri 11/15	Lecture 33: Virtual Memory I Readings: P&H 5.7, 5.8 Slides | Drive				
13	Mon 11/18	Lecture 34: Virtual Memory II Readings: P&H 5.7-5.8 Slides | Drive	Discussion 11		Homework 9 Due 11/26	
	Tue 11/19					
	Wed 11/20	Lecture 35: Guest Lecture				
	Thu 11/21					
	Fri 11/22	Lecture 36: Guest Lecture				
14	Mon 11/25	[HW Only] Lecture 37: I/O, Warehouse-Scale Computing	Discussion 12			
	Tue 11/26					
	Wed 11/27	No Lecture: Holiday				
	Thu 11/28					
	Fri 11/29	No Lecture: Holiday			Homework 10 Due 12/03	
15	Mon 12/2	[HW Only] Lecture 38: ECC, RAID	Discussion 13			
	Tue 12/3					
	Wed 12/4	Lecture 39: Guest Lecture				
	Thu 12/5					
	Fri 12/6	Lecture 40: Summary, What's Next?				
16	Mon 12/9	RRR Week				
	Tue 12/10	RRR Week				
	Wed 12/11	RRR Week				
	Thu 12/12	RRR Week				
	Fri 12/13	RRR Week				
17	Mon 12/16	Final: 8-11AM PT				