Class		Date	Торіс	Papers	Notes	Student Presenter	Project Schedule
1	W	8-Sep	Introduction and overview				
2	м	13-Sep	Introduction to Architectural Simulation	"ZSim: Fast and Accurate Microarchitectural Simulation of Thousand-Core Systems" pdf: <u>https://people.csail.mit.</u> edu/sanchez/papers/2013.zsim.isca.pdf	No presentation, no paper summaries.	N/A	
3	w	15-Sep	Hardware multi-threading and simultaneous multi-threading	(1) Kongetira, Poonacha; Aingaran, K.; Olukotun, K., "Niagara: a 32-way multithreaded Sparc processor," IEEE Micro, vol.25, no.2, pp.21,29, March-April 2005. pdf: https://ieeexplore.ieee. org/stamp/stamp.jsp?tp=&arnumber=1453485 (2) Eggers, S.J.; Emer, J.S.; Leby, H.M.; Lo, J.L.; Stamm, R.L.; Tullsen, D.M., "Simultaneous multithreading: a platform for next-generation processors," in Micro, IEEE, vol.17, no.5, pp.12-19, Sep/Oct 1997. URL: http://ieeexplore.ieee.org/stamp/stamp.jsp? tp=&arnumber=621209&isnumber=13512	No presentation, no paper summaries. Read (2) mainly, skim through (1).	N/A	
4	м	20-Sep	Multi-threaded applications and power management	Ryan Cochran, Can Hankendi, Ayse K. Coskun, and Sherief Reda. 2011. Pack & Cap: adaptive DVFS and thread packing under power caps. In Proceedings of the 44th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO-44). pp. 175-185, 2011. pdf: <u>https://www.bu.</u> edu/peaclab/files/2014/03/cochran_MICRO11.pdf		Daniel Wilson	
5	w	22-Sep	Multi-core cache and memory management	Po-An Tsai, Nathan Beckmann, and Daniel Sanchez. 2017. "Jenga: Software-Defined Cache Hierarchies". In Proceedings of the 44th Annual International Symposium on Computer Architecture (ISCA '17). ACM, New York, NY, USA, 652-665. http://people.csail.mit.edu/poantsai/papers/2017.jenga.isca.pdf		-	Mini Project 1 Out
6	М	27-Sep	OS Scheduling for Multi-core	(1) "Reinventing Scheduling for Multicore Systems": https: //www.usenix.org/legacy/event/hotos09/tech/full_papers/boyd- wickizer/boyd-wickizer.pdf (2) Juan Carlos Saez, Manuel Prieto, Alexandra Fedorova, and Sergey Blagodurov. 2010. A comprehensive scheduler for asymmetric multicore systems. In Proceedings of the 5th European conference on Computer systems (EuroSys '10). ACM, New York, NY, USA, 139-152. https://dl.acm.org/doi/pdf/10.1145/1755913.1755929	Paper summaries for (2) only. Skim through (1).	-	
7	w	29-Sep	Processing in memory	Junwhan Ahn, Sungjoo Yoo, Onur Mutlu, and Kiyoung Choi. 2015. PIM-enabled instructions: a low-overhead, locality-aware processing-in-memory architecture. In Proceedings of the 42nd Annual International Symposium on Computer Architecture (ISCA '15), 336–348. https://citeseerx.ist.psu. edu/viewdoc/download?doi=10.1.1.703.6945 &rep=rep1&type=pdf_		Margot Bauman	
8	M	4-Oct	Tiled architectures and dark silicon	(1) Taylor, M.B. et al., "The Raw microprocessor: a computational fabric for software circuits and general-purpose programs," Micro, IEEE, vol.22, no.2, pp.25,35, Mar/Apr 2002. pdf: http://ieeexplore.ieee.org/xpl/login.jsp? tp=&arnumber=997877&url=http%3A%2F%2Fieeexplore.ieee. org%2Fxpls%2Fabs_all.jsp%3Farnumber%3D997877 (2) Conservation cores: reducing the energy of mature computations, Ganesh Venkatesh, Jack Sampson, Nathan Goulding, Saturnino Garcia, Vladyslav Bryksin, Jose Lugo- Martinez, Steven Swanson, and Michael Bedford Taylor, Proceedings of the 15th Architectural support for programming languages and operating systems (ASPLOS), pages 205-218, 2010. pdf: http://doi.acm.org/10.1145/1736020.1736044	Paper summaries and student presentation for (2) only. Skim through (1).	Lucas Neves	
9	w	6-Oct	Neuromorphic computing	M. Davies et al., "Loihi: A Neuromorphic Manycore Processor with On-Chip Learning," in IEEE Micro, vol. 38, no. 1, pp. 82-99, January/February 2018. <u>https://ieeexplore.ieee.</u> org/document/8259423		Dylan Pollack	Mini Project 1 Due
J	M	11-Apr	No class				
10	т	11-Apr	No class Meltdown and Spectre: Vulnerabilities in Modern Architectures	https://meltdownattack.com/ Focus on the Meltdown paper mainly.	Paper summary and presentation only for Meltdown. Skim through website for Spectre.	Kellen Jay	

11	W	13-Oct	Introduction to Virtualization and Cloud	(1) Michael Armbrust, Armando Fox, Rean Griffith, Anthony D. Joseph, Randy Katz, Andy Konwinski, Gunho Lee, David Patterson, Ariel Rabkin, Ion Stoica, and Matei Zaharia. 2010. A view of cloud computing. Commun. ACM 53, 4 (April 2010), 50-58. pdf. http://delivery.acm.org/10.1145/1730000/1721672/p50-armbrust.pdf?ip=50.189.61.84 &id=1721672&acc=OPEN&key=BF13D071DEA4D3F3B0AA4B A89B4BCA5B&CFID=296622889&CFTOKEN=74579001& ac m =1393484038 1666e739ed1a5a3777744e68dd561ccd5 (2) Clearing the clouds: a study of emerging scale-out workloads on modern hardware, Michael Ferdman, Almutaz Adileh, Onur Kocberber, Stavros Volos, Mohammad Alisafaee, Djordje Jevdjic, Cansu Kaynak, Adrian Daniel Popescu, Anastasia Ailamaki, and Babak Falsafi, Proc. of the 17th international conference on Architectural Support for Programming Languages and Operating Systems, 2012, pages 37-48. pdf: http://dl.acm.org/citation.cfm?id=2150982	Paper summary only for (2). Read (1).	Niantong Dong	Mini Project 2 Out
12	M	18-Oct	Virtualization in data centers	Nedeljko Vasić, Dejan Novaković, Svetozar Miučin, Dejan Kostić, and Ricardo Bianchini. 2012. DejaVu: accelerating resource allocation in virtualized environments. In Proceedings of the 17th international conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS XVII), 423-436. pdf: <u>https://dl.acm.org/doi/10.1145/2189750.</u> 2151021		Burak Aksar	
13	w	20-Oct	Hypervisors, containers, and more on virtualization	(1) Linux Containers: Why They're in Your Future and What Has to Happen First (whitepaper): <u>https://www.dropbox.</u> <u>com/s/84c27hctigq40q4/linux-containers-white-paper-cisco-red- hat.pdf?dl=0</u> (2) Junaid Khalid, Eric Rozner, Wesley Felter, Cong Xu, Karthick Rajamani, Alexandre Ferreira, and Aditya Akella. Iron: isolating network-based CPU in container environments. In Proceedings of the 15th USENIX Conference on Networked Systems Design and Implementation (NSDI'18), 313–328. <u>https://www.usenix.</u> org/system/files/conference/nsdi18/nsdi18-khalid.pdf	Paper summary only for (2). Read (1).	Samir Farhat	
13	M	25-Oct	Serverless computing	Serverless in the Wild: Characterizing and Optimizing the Serverless Workload at a Large Cloud Provider, USENIX ATC'20. https://www.usenix.org/system/files/atc20-shahrad.pdf		Efe Sencan	
15	W	27-Oct	Interference management, AlOps for Cloud	(1) "Paragon: QoS-Aware Scheduling for Heterogeneous Datacenters". Christina Delimitrou and Christos Kozyrakis. In Proc. of the Eighteenth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), Houston, March 2013. pdf: <u>https://dl.acm.org/citation.cfm?id=2451125</u> (2) Toward ML- Centric Cloud Platforms <u>https://www.microsoft.com/en-</u> us/research/uploads/prod/2020/01/CACM20-produced.pdf	Paper summary and presentation only for (1). Read (2).	Mert Toslali	Mini Project 2 Due deadline extended to Oct 29
16	М	1-Nov	HPC architectures, management, and power	Choi, Dukhan, Liu, and Vuduc, "Algorithmic time, energy, and power of candidate HPC building blocks." <u>http://vuduc.</u> com/pubs/choi2014-archline-ipdps.pdf		Margot Bauman	
17	w	3-Nov	Data centers, new programming models, and resource management	"Mesos: A Platform for Fine-Grained Resource Sharing in the Data Center": <u>http://static.usenix.</u> org/events/nsdi11/tech/full papers/Hindman_new.pdf		Burak Aksar	
18	М	8-Nov	GPUs in HPC and HPC analytics	Machine Learning Models for GPU Error Prediction in a Large Scale HPC System https://ieeexplore.ieee.org/document/8416474		Lucas Neves	Mini Project 3 Out
19	W	10-Nov	HPC-Cloud blends	A. Gupta et al., "Evaluating and Improving the Performance and Scheduling of HPC Applications in Cloud," in IEEE Transactions on Cloud Computing, vol. 4, no. 3, pp. 307-321, 1 July-Sept. 2016, doi: 10.1109/TCC.2014.2339858. https://ieeexplore.ieee. org/document/6858018		Kellen Jay	Project Kick-off

20	м	15-Nov	Sustainability in data centers	Zhenhua Liu, Yuan Chen, Cullen Bash, Adam Wierman, Daniel Gmach, Zhikui Wang, Manish Marwah, and Chris Hyser. 2012. Renewable and cooling aware workload management for sustainable data centers. SIGMETRICS Perform. Eval. Rev. 40, 1 (June 2012), 175-186. https://citeseerx.ist.psu. edu/viewdoc/download?doi=10.1.1.221.6442 &rep=rep1&type=pdf	Skim through the part with theorems, focus on the rest.	Efe Sencan	Mini Project 3 Due
21	w	17-Nov	Quantum computing, co-design	/MM.2021.3094461. https://ieeexplore.ieee.org/stamp/stamp.	Read the paper but no paper summaries. Browse through (1) to learn about QC. Student presenter should discuss with the instructor before preparing the presentation.	Niantong Dong	
			Project status updates				
22	М	22-Nov					
	W	24-Nov	Thanksgiving Recess				
23	M	29-Nov	Approximate Computing	Subrata Mitra, Manish K. Gupta, Sasa Misailovic, and Saurabh Bagchi. 2017. Phase-aware optimization in approximate computing. In Proceedings of the 2017 International Symposium on Code Generation and Optimization (CGO '17). IEEE Press, Piscataway, NJ, USA, 185-196. https://dl.acm.org/citation.cfm?id=3049853		Samir Farhat	
24	w		Programmable Performance Counters, Security Analytics	Phmon: a programmable hardware monitor and its security use cases L Delshadtehrani, S Canakci, B Zhou, S Eldridge, A Joshi, M Egele, 29th USENIX Security Symposium (USENIX Security 20), 807-824. <u>https://www.usenix.</u>		Daniel Wilson	
	VV	1-Dec		org/system/files/sec20spring_delshadtehrani_prepub.pdf			
25	M	-	Project presentations	No paper.		-	
26	W	8-Dec	Project presentations	No paper.		-	
	R	9-Decem					Project Submission Due
			*Schedule is subject to change.				