

Syracuse University
College of Engineering and Computer Science
Department of Electrical Engineering and Computer Science

CSE 661 – ADVANCED COMPUTER ARCHITECTURE – SPRING 2020

Course Description	Advanced computer architecture including discussion of instruction set design (RISC and CISC), virtual memory system design, memory hierarchies, cache memories, pipelining, vector processing, I/O subsystems, co-processors, and multiprocessor architectures. Case studies of current systems.				
Instructor	Dr. Ehat Ercanli, CST 4-206L. eercanli@syr.edu . P: 443-3564. Office Hours: Tue & Thu 1:00 - 2:00 p.m.				
TA	Ying Yang, yyang160@syr.edu . Office hours: Mon 11:00a – 12:30p and Thu 4:00p – 5:30p.				
Meetings	Monday and Wednesdays, 3:45 – 5:05 p.m. at Slocum 214.				
Textbook	<i>Computer Architecture-A Quantitative Approach</i> by Hennessy & Patterson, 6 th ed, MKP.				
Grading	The course grade will be based on the quality of your work and reports. Homework: 16%. Quizzes: 10%. Term Paper: 16%. Exams 1, 2, 3-I: 16% each. Exam 3-II: 10%.				
Assignments Exams	Assignments are to be submitted by the assigned due date. No late assignments/exams will be accepted.				
Academic Honesty	You can discuss problems and solutions with each other, but all work submitted must be <u>the sole work of the author</u> . Cheating in any form is not tolerated, nor is assisting another person to cheat. Such offense will result in a failing grade 'F' and a letter of reprimand in your permanent student file.				
WWW	Our class web page at blackboard.syr.edu will be updated with lecture and review notes and homework assignments. Online quizzes are available from Wednesday after class until the following Wednesday midnight. Once you start your quiz, you need to complete it within the permitted time. Please see below the <u>due dates</u> for Homework (H) , Quizzes (Q) , Term Paper Proposal (TP1) , Term Paper Progress Report (TP2) , and Term Paper (TP) .				
Tentative Weekly Schedule	1. 1/13, 15	Fundamentals. Performance analysis.	Unit 1		
	2. 1/22	<i>No classes on Monday.</i> Instructions. Datapath.	Unit 2	Q1 (1/22)	
	3. 1/27, 29	Pipelining. Controller. Storage. I/O.	Unit 3	Q2 (1/29)	H1 (1/31)
	4. 2/3, 5	Memory hierarchy. Cache coherency.	Unit 4	Q3 (2/5)	
	5. 2/10, 12	Main memory. Virtual memory.	Unit 4	Q4 (2/12)	H2 (2/14)
	6. 2/17, 19	Review. EXAM 1 (weeks 1-6) on 2/19			
	7. 2/24, 26	Instruction-level parallelism.	Unit 5	Q5 (2/26)	
	8. 3/2, 4	Superscalar architectures. Software pipelining.	Unit 5	Q6 (3/4)	
	9. 3/9, 11	Data-level parallelism. Loop-level parallelism.	Unit 6	Q7 (3/11)	H3 (3/13)
	10. 3/16, 18	<i>Spring break. No classes.</i>			
	11. 3/23, 25	Thread-level parallelism.	Unit 7	Q8 (3/25)	TP1 (3/27)
	12. 3/30, 4/1	Review. EXAM 2 (weeks 7-12) on 4/1			
	13. 4/6, 8	Shared-memory multiprocessors.	Unit 8	Q9 (4/8)	
	14. 4/13, 15	Distributed-memory multiprocessors.	Unit 9	Q10 (4/15)	H4 (4/17)
	15. 4/20, 22	Warehouse-scale computers. Cloud systems.			TP2 (4/17)
	16. 4/27	EXAM 3 Part 1 (weeks 1-9) in class on 4/27			
	17.	EXAM 3 Part 2 (weeks 11-15) take-home due on 5/2			TP (5/5)

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- Attendance** You are expected to attend each class punctually and remain for the entire class period; tardiness disturbs everyone. You need to inform the instructor in advance if you expect to miss a class or leave the course before the end of the semester. If you miss class your absence will be excused by the instructor only if a doctor's certificate or other evidence is submitted. If you have been absent and fail to submit an excuse to the instructor, your absence will be considered unexcused. Even if your absence is excused, you remain responsible for the work associated with the class you missed.
- Academic Integrity** Syracuse University's Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the policy and know that it is their responsibility to learn about course-specific expectations, as well as about university policy. The university policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same written work in more than one class without receiving written authorization in advance from both instructors. The presumptive penalty for a first offense by an undergraduate student is course failure, accompanied by a transcript notation indicating that the failure resulted from a violation of Academic Integrity Policy. The standard sanction for a first offense by a graduate student is suspension or expulsion. For more information and the complete policy, see <http://academicintegrity.syr.edu/academic-integrity-policy/>
- Turnitin Syllabus Statement** This class will use the plagiarism detection and prevention system Turnitin. You will have the option to submit your papers and reports to Turnitin to check that all sources you use have been properly acknowledged and cited before you submit the paper to me. I will also submit all papers you write for this class to Turnitin, which compares submitted documents against documents on the Internet and against student papers submitted to Turnitin at SU and at other colleges and universities. I will take your knowledge of the subject matter of this course and your writing level and style into account in interpreting the originality report. Keep in mind that all papers and reports you submit for this class will become part of the Turnitin.com reference database.
- For more information about Turnitin for teachers and students, see turnitin.com.
- Students with Disabilities** If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), <http://disabilityservices.syr.edu>, located in Room 309 of 804 University Avenue, or call (315) 443-4498, TDD: (315) 443-1371 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented Disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.
- Religious Observances** SU religious observances policy, found at http://supolicies.syr.edu/emp_ben/religious_observance.htm, recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes and by the submission deadline for flexibly formatted classes.
- For fall and spring semesters, an online notification process is available through [MySlice/StudentServices/Enrollment/MyReligiousObservances](#).