EEL 6764 Principles of Computer Architecture

Schedule

Meeting Time:	Mon & Wed $5 - 6{:}15pm$
Location:	BSN 1201.
Credit Hours:	3

Teaching Staff

Instructor	Dr. Hao Zheng
Office	ENB 312
Email	haozheng@usf.edu
Phone	$(813)974 - 4757$
Office Hour	$1 - 2{:}30pm$, Mon. & Wed.

Teaching Assistant	Shamaria Engram	Faisal Qarah
Office	ENB 327	ENG 233
Email	sengram@mail.usf.edu	faisalq@mail.usf.edu
Office Hour	Tue & Thur, $4 - 6pm$	Tue, $10am - 12pm$

Prerequisites:

- CDA 3201 Logic Design or equivalent
- CDA 4205 Computer Architecture or equivalent

Course Description

This course covers principles of modern computer architecture, and quantitative analysis approaches to design tradeoffs in terms of cost, performance, and power/energy efficiency, etc. The objectives of this course are listed below.

- Understanding of the technology impacts on architectures
- Understanding of various aspects of modern computer architecture designs − memory hierarchy, instruction set design, pipelining, out-of-order execution, speculation, etc.
- Understanding of various parallelisms and their exploitations, *e.g*, instruction-level, thread-level, and data-level parallelism.
- Understanding of quantitative evaluation of design tradeoffs in terms of different parameters.

At the end of the course, students will also gain understanding of the interplays between architecture design and software, and how they can impact each other.

References

Required – *Computer Architecture: A Quantitative Approach* by John L. Hennessy and David A. Patterson, Morgan Kauffman, 6th Edition, ISBN 9780128119051.

Recommended – *Computer Organization and Design – The Hardware/Software Interface* by David A. Patterson and John L. Hennessy, Morgan Kaufman, 5th Edition, ISBN 13 : 978 – 0124077263, 2013.

Attendance: Required

Last Day to Drop with 'W': October 27th, 2018

Evaluation and Grade Distribution (Tentative)

	Weights	Dates
Homework	15%	
Quizzes	10%	
Mid-term Exam	25%	October 1st
Final Exam (comprehensive)	35%	Dec. 3rd, $3-5pm$
Term paper	15%	December 5th

Note: The exact date for the mid-term exam may change.

Final Grading Scale

Suppose your final grade percentage is x. The following table defines the mapping from x to a letter grade.

$x \geq 97\%$	**A+**	$90\% \leq x < 97\%$	**A**	$87\% \leq x < 90\%$	**A-**
$84\% \leq x < 87\%$	**B+**	$80\% \leq x < 84\%$	**B**	$77\% \leq x < 80\%$	**B-**
$74\% \leq x < 77\%$	**C+**	$70\% \leq x < 74\%$	**C**	$65\% \leq x < 70\%$	**C-**
$x < 65\%$	**F**				

Incomplete (I) grades will NOT be given.

Homework Assignments

- Approximately $6-8$ homework assignments will be given throughout this semester.
- Your homework solutions must be submitted electronically via Canvas.
- All assignments are individual, and the final submission must be your own work.
- Late homework submissions will **NOT** be accepted.
- Requests for re-grading must be submitted via email or in writing **within one week since a graded assignment is returned**.
- Additional specific requirements may be imposed for individual assignments. Read carefully each homework description when it is distributed.

Quizzes

- Throughout this semester, a number of quizzes will be given from time to time in class without announcement.
- There will be NO makeup for any missed quizzes.

Exams

- The midterm exam will be in class, and lasts 75 minutes.
- The final exam is **comprehensive**, and will last 2 hours.
- You must present your official USF ID for verification when taking the exams. You are NOT allowed to take exam(s) if your identity cannot be verified.

Topics (Tentative)

Introduction	Ch. 1
Memory hierarchy design	Ch. 2, App. B
Instruction set principles	App. A
Instruction level parallelism and pipelining	Ch. 3, App. C
Data level parallelism and vector processing	Ch 4, App. G
Thread-level parallelism and multiprocessors	Ch. 5
Interconnection networks (*if time permits*)	App. F

Course Communication

Canvas will be the major means for communications. Course lecture slides, homework assignments, grades, announcements, and other related materials will be posted only on Canvas. The following locations on Canvas will be used often during this semester.

- **Announcements** where all course related announcements are posted.
- **Assignments** where assignments are posted and your solutions are submitted. *Anything sent to anywhere else is ignored.*
- **Grades** where grades for assignments, exam(s), and the final project are posted.
- **Discussions** where questions and answers that are of interest to the entire class are posted.

In addition, your email inbox needs to be cleared because messages broadcast to the whole class will be sent out via announcements and/or emails. *You are responsible for not receiving emails due to the overflow of your email inbox.*

Academic Integrity/Academic Dishonesty

- Students are expected to be honest and not cheat on their assignments/examinations/project. Collaborations by forming study groups and having discussions with fellow students are highly encouraged, but copying each other's work is forbidden. You must write *your own solutions* in *your own words*. If you are unable to find the solutions to problems without step-by-step help from your study partners, you do not understand the solutions.
- Every student should read the University's policies on student conduct, academic integrity, etc, which can be found at the link below.

  http://regulationspolicies.usf.edu/regulations/pdfs/regulation-usf3.027.pdf.
- Students caught cheating in any form will receive an **FF** grade for the course.

General Policies

- All announcements and assignments will be posted through Blackboard. Students are required to look in Blackboard for course material and related information.
- Class Attendance is required although not monitored. Students are responsible for all information communicated during class. This information will not be necessarily duplicated in the class webpages.
- Academic dishonesty will not be tolerated and the student, in question, will be dealt with in accordance with the University policies.
- Cell phones may not be used as calculators. Cell phones must be turned off at all times including exams and lectures.
- The communication functions including text messaging on all devices must be turned off during exams.
- Students are not allowed to sell or distribute notes provided for this class.
- Students in need of academic accommodations for a disability may consult with the office of Students with Disabilities Services to arrange appropriate accommodations. Students are required to give reasonable notice to the instructor prior to requesting an accommodation. If accommodations are needed, a letter from the Office of Student Disability Services (SVC 1133) is required.
- Students who anticipate the necessity of being absent from class due to the observation of a major religious observance must provide notice of the date(s) in writing by the second class meeting.
- The instructor reserves the right to interpret the class policies if confusions may occur.

Emergency Situations

In the event of an emergency, it may be necessary for USF to suspend normal operations. During this time, USF may opt to continue delivery of instruction through methods that include but are not limited to: Canvas, Elluminate, Skype, and email messaging and/or an alternate schedule. It's the responsibility of the student to monitor Canvas site for each class for course specific communication, and the main USF, College, and department web-sites, emails, and MoBull messages for important general information.