

Pr. BEN CHOI**Description:**

Topics include: pipeline systems design, processor design techniques (concepts, analysis, performance comparison, implementation, commercial processors), memory system design, and interconnection media.

Credits: 3

Office hours: “Email (choi@latech.edu) for an appointment”

Tue: 12-2pm, 4-5:30pm; Wed: 2-5pm; Thu: 12-2pm, 4-5:30pm

Objectives (Goals):

- To understand concepts of parallel processing and design choices of implementing parallel execution within a single processor (pipeline, VLIW, and superscalar) and multiprocessor systems.
- To gain knowledge of the state of the art research topics on advanced computing systems.

Reference Text: *Advanced Computer Architecture: A Design Space Approach*, by Dezso Sima, Terence Fountain, and Peter Kacsuk, 1997. Or,

Modern Processor Design: Fundamentals of Superscalar Processors, by John Paul Shen and Mikko h. Lipasti, 2005

Representative Topics: <http://benchoi.info/Bens/Teaching/Csc521/index.htm>

Topics	Reading Chapter ACA	Reading Chapter MPD
Computer Evolution, Computational Models	1	1
The Concept of Computer Architecture	2	1
Introduction to Parallel Processing	3	1
Introduction to Instruction-Level Parallel Processors	4	1
Pipelined Processors	5	2
VLIW Architectures	6	
Superscalar Processors	7	4, 8, 9
Introduction to Data-Parallel Architectures	10	10
Introduction to MIMD Architectures	15	
Outlook and Current Research	19	6,7,8



Grading Plan:

Class participation & Attendance Assignments & Quizzes	10%
State of the Art Project	10%
Midterm Exam	40%
Final Exam	40%

Final grade may be normalized (or curved). For homework, quizzes, and exams, each student must work independently.

Attendance: Class attendance is governed by university regulations. Class attendance is regarded as an obligation and all students are expected to attend punctually all classes in which they are enrolled. Failure to do so may jeopardize a student's scholastic standing.

Misconduct: Academic misconduct is governed by university regulations. **The penalty for cheating and other forms of misconduct may result in an "F" in the course.**

Accommodations: Students needing testing or classroom accommodations based on a disability are encouraged to discuss those needs with me as soon as possible.

Academic Honor Code: In accordance with the Academic Honor Code, students pledge the following: Being a student of higher standards, I pledge to embody the principles of academic integrity.

Emergency Notification System: In the event that a disaster or other emergency results in campus closure, this course will continue via Moodle. You will be required to login to moodle.latech.edu for further instructions. Please enroll in the Emergency Notification System to receive official campus updates. You may also refer to ert.latech.edu for updated information.

COVID-19 related information:

- a. Students can access COVID-19-related information, guidelines, FAQs, and policies at Louisiana Tech's website: latech.edu/coronavirus
- b. Louisiana Tech's [Return to Campus Plan](https://latech.edu/return-to-campus) is located at latech.edu/return-to-campus. Masks are required to be worn indoors on campus. Masks are required to be worn outdoors if six feet of physical distance cannot be maintained. Every member of the Tech Family will need to take personal responsibility for their behavior, which includes wearing masks, maintaining physical distancing, washing hands regularly, using proper sneeze and cough practices, helping maintain clean academic and office areas, and monitoring for symptoms of COVID-19
- c. The direct link to the reporting protocol for students is located at latech.edu/coronavirus/return-to-campus-plan/for-students/. Students can reach out to Stacy Gilbert, Dean of Student Services & Academic Support, at stacyc@latech.edu for help with accommodations and additional information.
- d. Failure to comply with the Safety Protocols listed in the [Back to Campus Fall 2020](https://latech.edu/documents/2020/07/covid-return-book.pdf) booklet, latech.edu/documents/2020/07/covid-return-book.pdf, specifically on pages 5-7 about masks and social distancing, could result in students being in violation of the Classroom Behavior Policy listed on page 125 of the [Student Handbook](https://latech.edu/documents/2018/09/student-handbook.pdf) latech.edu/documents/2018/09/student-handbook.pdf.
- e. Information and contact numbers and sites for Louisiana Tech Counseling Services are located at: <https://www.latech.edu/current-students/student-advancement-affairs/counseling-services/>