

CS 4803/CS8803: GPU HW/SW

Instructor: Prof. Hyesoon Kim

Office Hours: Zoom Wednesdays at 11:00 AM ET.

Course Description:

This course explores the software and hardware aspects of GPU development. Through hands-on projects, you'll gain basic CUDA programming skills, learn optimization techniques, and develop a solid understanding of GPU architecture. Additionally, you'll delve into compiler principles to comprehend software-related GPU issues and read research papers on hardware challenges. By the end, you'll have enhanced your knowledge of compilers, programming, and computer architecture for modern GPUs.

Topics:

- GPU Programming
- Parallel Programming Fundamentals
- Compiler Backgrounds
- GPU Architecture

Prerequisites:

- C/C++ Programming and Python Programming
- No prior CUDA programming experience required.
- Equivalent to CS2200 (undergraduate computer architecture class).

Textbooks:

None required. All reading materials will be provided on Canvas.

Grading Breakdown:

Assessment	Type	Weight	Description
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Project 1: CUDA Programming	Programming Assignment	10%	Basic CUDA programming concepts.
Project 2: CUDA Programming II	Programming Assignment	20%	Performance optimization of CUDA programs.
Project 3: GPU Simulator	Programming Assignment	25%	Build a simple trace-driven GPU simulator.
Project 4: GPU Code Analysis	Programming Assignment	25%	Analyze and understand the performance of GPU code.
Homework	Multiple- Choice Quizzes	10%	Test your understanding of lecture content and readings.
Final Exam	Exam	10%	Covers all course topics.

Final Grade Algorithm:

- 90-100%: A
- 80-89%: B
- 70-79%: C
- 60-69%: D
- Below 60%: F

Late Policy:

- Homework: No late submissions accepted.
- Projects: Each day late reduces the score by 10%.

Communication:

- Private: Use Piazza private messaging for individual questions with the instructor and TAs.
- Public: Use Piazza public posting for general questions where classmates can contribute.

Online Platforms:

- Canvas: For assignment submission and lecture note distribution.
- Piazza: For class discussions and Q&A.

Academic Integrity:

This course adheres to the Georgia Institute of Technology's academic honor code:
<https://policylibrary.gatech.edu/student-life/academic-honor-code>

Accommodations:

Students with disabilities requiring accommodations should contact Prof. Kim within the first week. For more information, visit the Office of Disability Services:
<https://disabilityservices.gatech.edu/>

Discrimination and Harassment:

Georgia Tech prohibits discrimination and harassment based on any protected class. This class welcomes diverse viewpoints but will not tolerate discriminatory or harassing behavior.

