

# EE 7700-2: Graphics Processors (GPUs)

## Where/When

3142 Taylor Hall, Monday Wednesday Friday 13:40–14:30, **Spring 2008**

<http://www.ece.lsu.edu/gp/>

RSS: [http://www.ece.lsu.edu/gp/rss\\_home.xml](http://www.ece.lsu.edu/gp/rss_home.xml)

## Who

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Office hours: Monday–Friday: 9:00–10:00.

## Prerequisites

By Course: Credit or registration in EE 4720 or equivalent.

By Topic: Computer architecture and digital logic must be thoroughly understood. Students must also have a familiarity machine language and C++ programming.

## Topics

- Graphics Software/Hardware Organization
- Basics of 3D Computer Graphics
  - From airplanes to pixels.
- GPU APIs: OpenGL, Direct3D
  - Coding projects using OpenGL.
- Analysis of 3D Graphics Algorithms
  - Determination of floating-point and data-transfer needs.
  - Determination of control complexity and parallelism.
- Fixed-Function GPUs: Freezing the algorithm in hardware.
  - Exploitation of control simplicity and parallelism.
  - Texture access techniques.
- Programmable GPUs: Flexibility without sacrificing FP density and latency tolerance.
  - Vertex, fragment, geometry, and unified “shader” ISA and microarchitectures.
  - Case studies of NVIDIA, ATI, and other companies’ products.
- Stream Processors, General-Purpose GPU (GPGPU)
  - GPGPU: Using a GPU for specialized non-graphical computation.
  - Stream Processors: Specialized processors similar to programmable GPUs.

Topics subject to change.

## Text

Papers and other references. (No textbook.)

## Grading

35% Midterm Exam • 35% Final Exam • 30% Homework and Projects

Final exam weight may be increased for a student who shows significant improvement on the final exam.

Late assignment penalty: 10% per day late deducted. Missed-midterm-exam policy: at instructor’s discretion either a makeup exam, use final exam grade for midterm grade (*i.e.*, 70% final exam weight), or use of zero for midterm grade. Daily attendance: optional, however students are responsible for all material, instructions, and notices presented in class.