

# Flash-Aware Computing

## (Topics in Embedded Systems)

March 5, 2019

### ■ Course Goal

This course prepares graduate students for advanced research in flash-based storage systems/architecture areas. The core part of the course introduces key components of flash-based storage systems (such as SSDs) in a comprehensive fashion starting from NAND flash cells to flash translation layer to systems software. Based on the basic understanding on flash-based storage systems, students are exposed to current research topics in flash-related areas by studying recent technical papers from top systems conferences.

### ■ Instructor

Prof. Jihong Kim (of CSE)

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Office hours: T 1:15 – 1:55 @302-328 (or by appointment)

### ■ Meeting Times

➤ TTh 15:30 – 16:45 @302-107

### ■ Prerequisites

Undergraduate-level Computer Architecture & Operating Systems

■ **Course Organization**

This course consists of two main parts:

Part 1: Lectures on Key Components of Flash-based Storage Systems

Topics include:

- NAND Flash Basics
- Flash Translation Layers
- SSD Architecture
- Flash-Aware Operating System Issues
- Flash-Aware File System Issues
- Host/Application Managed Flash Issues

Part 2: Recent Topics in Flash-based Storage Systems

Students present recent flash-related papers from top systems conferences such as FAST, ATC, EUROSYS, ISCA, MICRO and DAC.

■ **Evaluation**

- Final Exam: 40%
- Assignments: 30%
- Group Project: 20%
- Paper Presentation: 10%
- Attendance: -5%