Boston University
Computer Science Department
CAS CS 562: Advanced Database Applications
Spring 2018

Course Description

The goal of the course is to introduce students to modern database and data management methods and systems. The first part of the course will be focused on efficient query processing and indexing techniques for spatial, temporal, and multimedia databases. The next part of the course will cover some recent advances in modern database systems including databases on the cloud, cluster and distributed databases, key-value stores, NoSQL systems, and secure database systems. Students will have to solve some small written and programming assignments that will help them to understand and digest the covered material.

Instructor: Prof. George Kollios, *gkollios@cs.bu.edu*, phone 617-358-1835.
Office Hours: Monday 11:00am - 12:30pm and Tuesday 1:00pm - 2:30pm in MCS 283, or anytime I am in my office.

Course Webpage: `http://www.cs.bu.edu/faculty/gkollios/cs562s18/`

Time and Place: Monday and Wednesday 4:30pm - 5:45pm in CAS B20.

Text: This course has no textbook but copies of instructor's transparencies and notes, as well as copies of selected articles will be used.

Prerequisites: Basic data structures and database background (CS 460 or equivalent), or permission of the instructor. Some math background (basic probability theory and linear algebra) is also required.

Grading Policy: Tentative grade break-up:

- Homeworks and Project 50%
- Midterm 20%
- Final 30%

Incompletes will not be given.

Collaboration/Academic Honesty: All course participants must adhere to the CAS Academic Conduct Code. All instances of academic **dishonesty** will be reported to the academic conduct committee.

Important Dates
Last day to drop *without* a W: Thursday, February 22, 2018.
Last day to drop *with* a W: Friday, March 30, 2018.
Midterm Exam (Tentative): Monday, March 19, 2018, in class.
Final Exam (Tentative): Friday, May 11, 2018 at 6:00-8:00 PM.

Late Policy – Make up exams: No late written assignments will be accepted. No make-up exams (except under extremely unusual circumstances).

Tentative Schedule of Classes

Week#	Topics
1	Introduction
2	Geo-Spatial Databases
3	Spatial Database Indexing
4	Temporal Database Indexing
5	Spatio-temporal Databases
6	Multimedia Databases
7	Multimedia and Time Series Analytics
8	Time Series Indexing
9	Cloud databases, Map-Reduce, Hadoop
10	Theoretical and Practical aspects of Hadoop
11	Key-value stores and NoSQL
12	Next Generation large scale data management systems
13	Database Security and Privacy
14	Searchable encryption and Database systems
15	Project Presentations and Conclusion