

AMS 560: Big Data Systems, Algorithms and Networks (Spring 2017)

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Office Hours: Mon/Wed 1-2pm, Math Tower 1-118.

Lectures: Mon/Wed 2:30-3:50pm, Frey Hall 326

Course Description: This course will cover topics include the web graph, search engines, online algorithms, and recent progress in big data systems, such as analytics, storage, resource allocation, and energy-efficient computing. There will be a combination of lectures, presentations from students, and course projects. The grade will be based on homework (20%), presentation (30%), projects (40%), and class participation (10%). No textbook required.

Topics (subject to change):

1. Understanding the Internet structure
 - a. The web graph and beyond
 - b. Giant component of the web
 - c. Heavy tail and small world
 - d. Mini-course project: web structure of Stony Brook University
2. Questions and answers about our network
 - a. How does Google rank webpages?
 - b. How does Google sell ad spaces?
 - c. How does Netflix recommend movies?
 - d. How do I influence people on Facebook and Twitter?
3. Big data systems
 - a. Data centers and technology trends
 - b. Storage and file system, e.g., Google File System
 - c. Resource allocation and scheduling
 - d. Streaming systems, e.g., Spark
 - e. Geo-distributed analytics
 - f. Energy-efficient computing
 - g. Course project: Data analytics using Spark/Storm
4. Algorithms with uncertainties
 - a. Online algorithm and competitive analysis
 - b. Learning and regret

Disability Support Services (DSS) Statement:

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities>.

Academic Integrity Statement:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html.

Critical Incident Management Statement:

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.