CS 524 Introduction to Cloud Computing Syllabus

The syllabus below describes a recent offering of the course, but it may not be completely up to date. For current details about this course, please contact the course coordinator. Course coordinators are listed on the course listing for undergraduate courses and graduate courses.

Text Books

Required
Igor Faynberg, Kui-Lan Lu, and Dor Skuler, *Cloud Computing: Business Trends and Technologies*, Wiley, 2015

Week-by-Week Schedule

Week	Topics Covered	Reading	Assignments
1	Definition of basic concepts, history, technical and economic considerations, refresh on distributed systems;, and course overview	Lecture slides	A set of problems (based on the assessment) to refresh students understanding of resource management and scheduling
2	Web as the portal to Cloud: Detailed overview of Web protocols (HTTP, SOAP, and XML) and relevant API	Lecture slides and references to the IETF and W3C standards	A set of problems to ensure proficiency with the Web matters
3	Virtualization: hypervisors, paravirtualization, with the case study of Xen and VMware (and possibly others)	Lecture slides, references to the book on Xen	A set of problems on virtualization
4	Virtual I/O. Resource management in the Cloud. Prevention and avoidance of deadlocks in the distributed environment (as opposed to a single processor)	Lecture slides	
5	Consistency in distributed databases, scheduling and structured properties of transactions	Lecture slides (reference to Maekawa and Oldehoeft)	A set of 12 problems to ensure understanding of the material of this and the previous lectures
6	Midterm		
7	Scheduling in multi-nodal systems, trade-off in execution time vs. bandwidth, load balancing. Explanation of the programming assignment (simulation)	Lecture slides, references to papers	A set of scheduling problems. A simulation assignment for the rest of the semester
8	Overview of MapReduce	Lecture slides and references to the original documents at Google site	
9	Overview of Hadoop	Lecture slides and reference to the Hadoop site	Programming problems with Hadoop
10	Security and Identity Management in Cloud in support of privacy (Case study: HIPAA requirements.)	Lecture slides. References to the NIST and HIPAA sites	

Week	Topics Covered	Reading	Assignments
11	Identity Management in the Cloud with OpenID and OAuth	Lecture slides. References to OpenID community specifications and OAuth 2.0 RFC (or stable Internet Drafts)	A set of problems to ensure understanding of OAuth
12	Cloud API case studies: Google and Amazon		
13	Review of students presentations on the simulation results		
14	Final		