6.989 Introduction to Network Coding.

Spring 2009

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Textbook: *Network Coding: An Introduction*, by T. Ho and D. Lun
available from the Coop
Readings will be posted on the class website: http://stellar.mit.edu/S/course/6/sp09/6.989/

Assignments:

- The homeworks will consist of problem sets, paper reports and a final project
  
  Hmwk 1: issued Feb. 11, due Feb. 25: paper report
  Hmwk 2: issued Feb. 25, due Mar. 4: problem set
  Hmwk. 3: issued Feb. 11, due Mar. 11: project proposal
  Hmwk. 4: issued Mar. 11, due Mar. 30: paper report
  Hmwk. 5: issued Mar. 30, due Apr. 6: problem set
  Hmwk. 6: issued Apr. 6, due Apr. 20: paper report
  Hmwk. 7: issued Apr. 20, due Apr. 27: problem set
  Hmwk. 8: issued Apr. 27, due May 11: paper report
  Hmwk. 9: issued Feb. 11, due last day of classes: final project
• There will be presentations of the final projects in the last two weeks of class. These will be scheduled.

• Every student will be responsible for Latexing the solutions for one problem set problem set. There will be 3 problem sets, each with four problems. The Latexed version will be due one week after the problem set is returned.

• The readings will be from the textbook and from papers on the web site. The paper reports will be between two and five pages, 11 point (Latex preferred). Each reading will be marked with a number indicating whether it is a possible choice for a particular Hmwk (1, 4, 6, 8).

Grading:
The weighting is: problem sets - 5 % each; problem set solution - 5 %; problem set paper reports - 10 % each; final project proposal - 5 %; final report presentation - 10 %; final project - 25 %.

Syllabus:
• Lectures 1, 2: Introduction to applications of network coding (guest lectures by Professor Katabi)

• Lectures 3, 4, 6: Algebraic foundations of network coding.

• Lecture 5: Network coding for wireless cooperative communications (guest lecture by Professor Fitzek)

• Lectures 7, 8, 9, 10: Multicast, random network coding, coding for erasures and generalization of Slepian-Wolf

• Lecture 11: Non-multicast connections.

• Lectures 12, 13, 14: Optimization and network coding.

• Lectures 15, 16: Feedback and delay.

• Lectures 17, 18, 19: Security in network coding.

• Lecture 20: Analog network coding.
- Lectures 22, 23, 24, 25: In-class presentations.