

Course: ECE 594 (Special Topics: Network Information Theory)

- Instructor: Daniela Tuninetti, danielat@uic.edu
- Lecture delivery method: online synchronous. Lectures will be recorded and made available to all students registered for the class through Blackboard.
- Laboratory delivery method: not applicable.
- Lab Fee: not applicable.

Note: This course naturally follows ECE 534, which is taught every year in the ECE department at UIC. This advanced graduate class goes beyond point-to-point systems (with only one sender and one receiver) and develops a fundamental theory of performance tradeoffs in networked systems (with multiple senders or receivers). The purpose of this course is to introduce the students to some of the cutting-edge research in multi-user systems that have been at the core of the development of wireless cellular systems and storage systems, while giving them a more general background on methodologies and approaches to analyze complex interconnected systems. Tentative schedule:

Topic	Hours
Revision of ECE 534 and basic mathematical tools	3
Multiple Access Channels	3
Channels with States	3
Broadcast Channels	3
Interference Channels	3
Source Compression with Side Information	3
Distributed Source Compression	3
Relay Channels	3
Compute and Forward for relay networks	3
Interference Alignment for interference networks	3
Network Coding and Index Coding	3
Cooperative Communications and Feedback	3
Joint Source Channel Coding	3
Coded Caching	3
Coded Distributed Computing	3
TOTAL	45