ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE
School of Computer and Communication Sciences

Advanced Digital Communications

Time and location:
Mondays, 13–15, ELA 1 (lecture)
Tuesdays, 13–15, ELA 2 (lecture)
Tuesdays, 15–17, ELA 2 (exercise)

Instructor:
Emre Telatar (INR 117, 37693, `emre.telatar@epfl.ch`)
Office hours: by appointment.

Teaching assistants:
Mine Alsan (INR 036, `mine.alsan@epfl.ch`)
Vahid Aref (INR 034, `vahid.aref@epfl.ch`)
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Administrative assistant:
Yvonne Huskie, (INR 133, 37694, `yvonne.huskie@epfl.ch`)

Prerequisite:
Probability and Statistics (I and II) or
Stochastic processes for communications

Web page: `http://ipg.epfl.ch/`

Textbook:
T. M. Cover and J. A. Thomas, *Elements of Information Theory,* Wiley, 2006

Course mechanics:
Weekly assignments, (two of the weeks will be graded; 10%)
Midterm quiz (40%),
Final exam during finals period (50%).

Approximate Outline:
Properties of information measures (4–5 lectures)
Source coding (7–8 lectures)
Capacity and the channel coding theorem (5–6 lectures)
Coding techniques for reliable communication (4–5)
Multi-user channels (4–5 lectures)
Additional topics (1–2 lectures)

Reference Material:
1. R. G. Gallager, *Information Theory and Reliable Communication,* Wiley, 1968.
2. C. E. Shannon (with W. Weaver) *The Mathematical Theory of Communication*, U. of Illinois Press, 1963. (see also the course webpage)
3. J. M. Wozencraft and I. M. Jacobs, *Principles of Communication Engineering,* Wiley 1965 (also, Waveland, 1990).