

## Information Theory and Coding

### Time and Location:

Mondays, 11h15-13h, BC 01 (lecture)  
Tuesdays, 13h15-15h, ELA 2 (lecture)  
Tuesdays, 15h15-17h, ELA 2 (exercise)

### Instructor:

Emre Telatar (INR 117, emre.telatar@epfl.ch)  
Office Hours: By appointment

### Teaching Assistant:

Adway Girish (INR 038, adway.girish@epfl.ch)  
Office Hours: By appointment

### Administrative Assistant:

Muriel Bardet (INR 137, muriel.bardet@epfl.ch)

### Prerequisites:

Probability and Statistics (I and II) or Stochastic Processes for Communications

**Webpage:** <https://ipg.epfl.ch> > Teaching > 2023-24 > Information Theory and Coding

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

### Course Mechanics:

Weekly exercises (ungraded)  
One graded homework (date TBA, 10%)  
Midterm exam (date TBA, 40%)  
Final exam (date TBA, 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 lectures)  
Multi-user channels (4-5 lectures)  
Additional topics (1-2 lectures)

### Additional References:

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).