

Course Title: Information Theory	Number of Units 1
SSD : ING-INF/05	CFU: 6
<p>Course aims: The field is at the intersection of mathematics, statistics, computer science. The course is highly recommend for students and researchers in fields of communications, data compression, and statistical signal processing. However it would be invaluable also for students, planning to delve into fields ranging from neuroscience, to machine learning. Students will acquire high familiarity with measures of information and uncertainty such as mutual information, entropy, and relative entropy. Students in probability and statistics will gain an appreciation for the interplay between information theory, combinatorics, probability, and statistics.</p>	
<p>Course Description: The course explores the basic concepts of Information theory. Self information, mutual information, discrete memoryless sources, entropy, source coding for discrete memoryless channels. Data compression to the entropy limit. Huffman coding. Arithmetic coding. Discrete memoryless channels, channel capacity, converse to the coding theorem, noisy channel coding theorem, random coding exponent, Shannon limit. Gaussian channels. Kolmogorov complexity. Asymptotic equipartition property. Applications to communication and data compression</p>	
<p>Assumed Background: A solid first course in probability is required. The course demands the motivation to deal with concepts that may be more abstract than the ones previously encountered</p>	
<p>Assessment methods:</p>	