

Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
INF365	Information Theory	6	3	0	0	3	4

Prerequisites	
Admission Requirements	

Language of Instruction	French
Course Type	Elective
Course Level	Bachelor Degree
Objective	<ul style="list-style-type: none">• The description of the models for the algorithmic reasoning of information flow,• The study of the effects of theoretical information models on current applications,• The reasoning of theoretical background of data structures through different scales,• Information coding, compression, channel capacity, information flow and related studies, consist the main concepts of the course.
Content	<ol style="list-style-type: none">1.Week Algorithmic Complexity2.Week P-NP Completeness3.Week Information and Entropy4.Week Relative Entropy, Mutual Information5.Week Shannon's Effect6.Week Compression Theory7.Week Compression Algorithms8.Week Midterm9.Week Channel Capacity10.Week Universal Source Coding11.Week Lempel-Ziv Coding12.Week Network Information Theory13.Week Information Theory Inequalities14.Week Statistical Techniques
References	<ol style="list-style-type: none">1-Elements of Information Theory, Second Edition, Thomas M. Cover, Joy A. Thomas, Wiley-Interscience, 20062-Computational Complexity, S. Arora, B. Barak, Cambridge University Press, 2009

Theory Topics

Week	Weekly Contents
1	Algorithmic Complexity
2	P-NP Completeness
3	Information and Entropy
4	Relative Entropy, Mutual Information
5	Shannon's Effect
6	Compression Theory
7	Compression Algorithms
8	Midterm
9	Channel Capacity
10	Universal Source Coding
11	Lempel-Ziv Coding
12	Network Information Theory
13	Information Theory Inequalities
14	Statistical Techniques