

Program	09TT- Engineering in Telecommunication Technologies and Services
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Course number and name	
Number	95000027
Name	Information Theory Teoría de la Información
Semester	3Y-5S

Credits and contact hours	
ECTS Credits	4.5
Contact hours	48

Coordinator's name	Juan B. Riera García
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Specific course information		
Description of course content		
Entropy and Mutual Information. Principles and algorithms of data compression. Error correcting codes.		
List of topics to be covered		
Entropy. Joint entropy and conditional entropy. Mutual information. Chain rules. Entropy of random process. Markovian models. Data compression. Kraft inequality. Optimal codes. Shannon encoding. Huffman codes. Alphabetic encoding. Dictionary encoding. Channel capacity. Shannon theorem. Error correcting Codes. Principles. Linear codes. Generator and parity matrices. Decoding and syndrome. Standard array. Correction and detection probability of error. Cyclic codes. Polynomial structure and results. Retransmission systems.		
Prerequisites or co-requisites		
Probability Theory		
Course category in the program		
<input type="checkbox"/> R (required)	<input type="checkbox"/> E (elective)	<input type="checkbox"/> SE (selective elective)
X		

Specific goals for the course

Specific outcomes of instruction

RA100: Understanding and mastery of characterization and description of deterministic and random signals and their application to the coding of voice, data, audio and video and characterization of disturbances and noise.
 RA101: Understanding and mastering the techniques of source coding, channel coding and encryption of signals.

Student outcomes addressed by the course

CECT1 , CECT4

Bibliography and supplemental materials

Chapters 1 to 5 and 8 of “Elements of Information Theory” of T.Cover. Wiley Series in Telecommunications and Signal Processing, 1991
 Chapters 1 to 4 of “Error Control Coding” Shu Lin & D. Costello, Pearson-Prentice Hall, 2004.
 Class notes

Teaching methodology

__ lectures x	__ problem solving sessions x	__ collaborative actions	__ laboratory sessions
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Other: