

IDENTIFICATION

Course code : SEC601
ECTS : 1

DURATION

Lectures : 6
Tutorial classes : 14
Labs : 0
Total : 20

Project :
Personnal work :

ASSESSMENT

Continuous assessment : two written exams

TEACHING MATERIALS

Slides and guided exercise handouts.

LANGUAGE

English

CONTACT

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UE : UE6-CYBER

COURSE : Information Theory

SCOPE OF THE COURSE

OBJECTIVES

The aim of this course is to enable engineering students to understand how information theory mathematically evaluates the performance limits of communication and data processing systems.

COMPETENCE AND SKILLS

- Select cryptographic tools suited to a project specification
- Design, from concept to production deployment, a company's IT network while addressing QoS and security issues
- List and implement network protocols for IoT
- Perform exploratory data analysis

PROGRAM

- Information source : information quantity, source entropy and source coding, mutual information, Huffman algorithm.
- Channel capacity : communication channel concept and description in information theory, conditional entropy, definition of a discrete channel and a code on this channel.
- Error detection and correction codes : different types of codes (block, convolutional), optimal decision on a binary-input channel.
- Error detection : cyclic redundancy check (CRC) codes
- Error correction : Reed-Solomon

BIBLIOGRAPHY

Abdelghafour Berraissoul - Introduction to Information Theory and Source Coding
Éditions Ellipses

REQUIREMENTS

Module "Probability, Random Variables" from S5.