Guidelines to *Discrete Mathematics* course

This document covers the guidelines for a *Discrete mathematics* course that pretends present some applications to computer engineering from the mathematical point of view.

The course is made up of three units. In each of them, basic mathematical concepts will be addressed from which to present an application to computing.

The first unit covers relational databases from the perspective of set theory. A relational database is nothing more than a subset of a Cartesian product.

In the second unit, logic circuits are analyzed from the perspective of first-order logic. Both are examples of a Boolean algebra.

In the third unit, public and private key cryptography is discussed as modular arithmetic application examples.

Each unit is based on three documents that collect respectively the theoretical content, practical exercises, and a propose 'maths in practice' activity in which a computing application problem is presented to be solved in groups.

To follow the course the students should use the following approach:

1. Review the theorical documentation of each unit and solve the corresponding proposed exercises.
2. Use the forum to share the solutions to the proposed problems with other students. In these forums, all students can pose or answer questions. Peer collaboration is a very powerful tool for improving abilities associated to problem solving.
3. Participate in group work sessions in which the applications of discrete mathematics to computer engineering are presented.

Online sessions

Date	Content	Link
Tuesday, **October 5**, 2021 **16,00-18,00** (UTC+2)	Activity 1. Relational DDBB	
Tuesday, **November 9,** 2021 **16,00-18,00** (UTC+1)	Activity 2. Logic circuits	Join Zoom Meeting
Thursday, **December 2**, 2021 **16,30-18,00** (UTC+1)	Activity 3.1 Cryptography I (Basic concepts and Private key)	https://us02web.zoom.us/j/6320098921
Thursday, **December 9**, 2021 **16,30-18,00** (UTC+1)	Activity 3.2 Cryptography II (Public key)	Meeting ID: 632 009 8921

The main goal of these sessions is for students from different countries to work together in the resolution of engineering problems from a mathematical point of view. Join us!