

# Modélisation et simulation

## Lecturer

Gianluca BONTEMPI (Coordinator)

## Course mnemonic

INFO-F305

## ECTS credits

5 credits

## Language(s) of instruction

French

## Course period

First term

## Campus

Plaine

## Course content

1) Introduction to modelling and simulation 2) introduction to dynamical systems 3) Discrete-state and discrete-time systems 4) continuous time dynamical systems 5) continuous linear systems 6) nonlinear continuous systems 7) discrete-time systems 8) Monte Carlo simulation 9) discrete-event simulation

## Objectives (and/or specific learning outcomes)

Introduction to the notions of modelling and simulation of dynamical systems and their application to real problems. Introduction to the tools (Simulink) and languages for computer simulation.

## Pre-requisites and co-requisites

### Pre-requisites courses

INFO-F205 | Calcul formel et numérique | 5 crédits

### Co-requisites courses

INFO-F205 | Calcul formel et numérique | 5 crédits

## Teaching method and learning activities

Lectures, exercises and practical assignments. Some assignments involve practical work using the software package Octave.

## References, bibliography and recommended reading

1) D. G. Luenberger (1979) "Introduction to Dynamic Systems. Theory, Models and Applications". J. Wiley and Sons. 2) S. H. Strogatz (1994) "Nonlinear dynamics and chaos" Westview Press. 3) S. Lynch (2004) "Dynamical systems with applications using MATLAB" Birkhauser. 4) S. Rinaldi (1981) "Teoria dei sistemi" Clup. 5) A. M. Law, W. D. Kelton (1991) "Simulation modeling and analysis", McGraw Hill

## Course notes

Syllabus and Université virtuelle

## Other information

### Place(s) of teaching

Plaine

### Contact(s)

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- > Adresse postale: Département d'Informatique, Bld de Triomphe, CP 212

## Evaluation method(s)

written examination and Project

### Evaluation method(s) (additional information)

Modelling computer project (with Octave)+ written exam

### Determination of the mark (including the weighting of partial marks)

18/20 (written assessment), 2/20 (project)

### Main language(s) of evaluation

French

## Programmes

### Programmes proposing this course at the faculty of Sciences

BA-INFO | Bachelor in Computer science | unit 3, BA-MATH | Bachelor in Mathematics | unit 3 and MA-ACTU | Master in Actuarial Science | finalité Professional/unit 1

