

# Embedded systems design

**Lecturer**

Jean-François RASKIN (Coordinator)

**Course mnemonic**

INFO-F410

**ECTS credits**

5 credits

**Language(s) of instruction**

English

**Course period**

Second term

**Campus**

Plaine

## Course content

Introduction to the notion of embedded system -- Timed and Hybrid automata -- Principles of control theory -- Game theory and controller synthesis. Tools: Lustre, UppAal, PhaVer et XCos.

## Objectives (and/or specific learning outcomes)

The main objective of the course is to get students familiar with the typical problems and constraints that arise when designing and developing embedded systems. The course will also introduce theoretical and practical solutions to these typical problems, that the students are expected to master and be able to apply to realistic case studies. At the end of the course, students should be able to design and implement an embedded systems, following the model-centric design. This approach states that the system should be design first as a rigorously stated model, which will allow to offer strong guarantees about the final system. More precisely, the students are expected to:

- > be able to perform a rigorous analysis of a given problem, while taking into account the classical constraints of an embedded system (tools to carry out this analysis will be studied during the lectures).
- > be able to implement the designed system, according to the model.

## Pre-requisites and co-requisites

### Course having this one as co-requisit

INFO-Y099 | Multicore programming | 6 crédits

## Teaching method and learning activities

Theory and practical lectures + project development.

## References, bibliography and recommended reading

Rajeev Alur. Principles of Cyber-Physical Systems, MIT Press, 2015. ISBN: 9780262029117

## Course notes

Syllabus and Université virtuelle

## Other information

### Place(s) of teaching

Plaine

### Contact(s)

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## Evaluation method(s)

Other, Oral examination and Project

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

The project grade is the final grade. The project defense is the oral examination for the course.

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

The project grade is the final grade.

### Main language(s) of evaluation

English

## Programmes

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

MA-INFO | Master in Computer science | finalité Professional/unit 1 and finalité Professional/unit 2

## Programmes proposing this course at the Brussels School of Engineering

MA-IRIF | Master of science in Computer Science and  
Engineering | finalité Professional/unit 2

