

Hardware



ECTS
4 credits



Component
INSTITUT
NATIONAL
DES SCIENCES
APPLIQUEES
TOULOUSE



Number of
hours
55h

Presentation

Description

Programme (detailed contents):

- * System Design part:

The lecture begins with a presentation of the object paradigm. In this part, many various examples are given to illustrate the object world: systems of services or software and hardware systems. The second part deals with the specificity of an object-oriented design process. This process is compared to a functional approach. The lecture moves on to an UML introduction. The last part details the most widely used UML diagrams. It starts with use case and sequence diagrams, then structure (class and composite structure) diagrams are studied. Finally, behaviour (state and activity) diagrams are presented. Students assess their knowledge with exercises and labworks during which they have to model several complex systems.

- * Programming of microcontroller part :

The functions and the programming of the STM32 (based on a ARM/CortexM3 core) is studied essentially in labwork. Half of time is devoted to a project. This project consists with the software development of an embedded system embarked.

Organisation:

The 2 parts are held in parallel and are the subject of distinct evaluations

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

- * Programming of microcontroller part :
 - * Programming specificities of the peripheral units for microcontroller.
 - * How to take into account hardware constraints for the design of embedded system.
- * System Design part:
 - * o the concepts of object paradigm.
 - * o the concepts of object-oriented design process
 - * o the main UML diagrams involved in an object modelling: use case diagram, sequence diagram, state and activity diagram and composite structure diagram.

The student will be able to:

- * Programming of microcontroller part :
 - * To select an architecture processor adapted to the software application and to the process configuration.
 - * To conceive and test the techniques of the programming by hardware interruption.
 - * To use debug tools and test in the context of cross-development.
 - * To find information into datasheet.
- * System Design part:
 - * o breakdown a system (which could be software or hardware) with an object-oriented approach
 - * o choose the diagrams which are most appropriated according the student viewpoint: structure, behaviour, interaction

propose an object-oriented UML model of a software or hardware system

Useful info

Place

› Toulouse