



2SC6390 – Smart system for personalized blood glucose control

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Department: DOMINANTE - VIVANT, SANTÉ, ENVIRONNEMENT, DOMINANTE - SYSTÈMES COMMUNICANTS ET OBJETS CONNECTÉS, DOMINANTE - GRANDS SYSTÈMES EN INTERACTION

Language of instruction: FRANCAIS

Campus: CAMPUS DE RENNES

Workload (HEE): 40

On-site hours (HPE): 27,00

Description

The objective is to offer a blood glucose regulation support system for diabetic patients;

This system must address various issues: operational safety and ease of use for the patient, digital integration of control algorithms, ability to interact with control elements (subcutaneous blood glucose sensor, micro insulin delivery pump,...) via various communication protocols and low energy cost; It must allow local interaction with the patient and remote interaction with a doctor for the monitoring of biomedical data.

Quarter number

ST5

Prerequisites (in terms of CS courses)

Modeling

Information systems and programming

Syllabus

Understanding the issue

Definition of requirements (safety, comfort,...)

Definition of the functional and physical architecture of the control system

Modeling and study of a corrector

Study of the embedded integration of the corrector

Study of the aspects of patient interface and communication with the embedded controller

Integration and Validation

Synthesis



Class components (lecture, labs, etc.)

Work in groups of 5-6 students

Grading

Summary notes, Final defense and demonstration

Learning outcomes covered on the course

Students will be able to:

- Apply the principles of a system analysis methodology
- analyze and carry out the integration of a real time regulation
- have programming bases for the software components dedicated to embedded systems, and for their inter-communication

Description of the skills acquired at the end of the course

- C1 Analyse, design, and build complex systems with scientific, technological, human, and economic components
- C2 Develop in-depth skills in an engineering field and a family of professions
- C4 Have a sense of value creation for his company and his customers
- C6 Be operational, responsive, and innovative in the digital world
- C7 Know how to convince