2SC6390 – Smart system for personalized blood glucose control

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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 sofware 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 Develp 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