2SC5990 – Design of a motorised wheelchair for people with reduced mobility

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Department: DOMINANTE - VIVANT, SANTÉ, ENVIRONNEMENT, DOMINANTE - ENERGIE
Language of instruction: FRANCAIS
Campus: CAMPUS DE METZ
Workload (HEE): 40
On-site hours (HPE): 27,00

Description

This integration teaching, which is part of the thematic sequence "Assistance and autonomy of the person", deals with the concepts of how to operate an electric wheelchair for a paralyzed person. Such a chair has a joystick for controlling motors that actuate the wheels. The function of the chair must be as accurate and as fast as possible to respond to the users inputs. The mechanics, the electronics and the algorithms used for the control participate together to obtain the desired performances.

Quarter number
ST5

Prerequisites (in terms of CS courses)
Control of a motorization chain

Syllabus
Different topics will be proposed as:
- study and design of an electronic control board for electrical motors,
- study and design of the computer program to put in the microprocessor,
- study and design of connectivity with other objects (smartphone, internet),
- simulation of the mechanical behavior of the system in order to optimize the control ...

Class components (lecture, labs, etc.)
The students will choose, in groups of 3 to 5, one of the proposed topics. These topics will be dealt with during the project time (from Monday to Thursday) and an evaluation will be done on the last day (Friday).

Grading

Students will be required to provide a written report by group and will have to support their work with an oral presentation. The mark of the report will be 50% in the final mark for all the members of the group and the individual mark obtained at the oral presentation will also be 50% of the final mark.

Resources

Teaching will be in the form of a project during which students will have access to computer, electronic and mechanical equipment (depending on the subject of the project).

Learning outcomes covered on the course

At the end of this course, students will be able to:
- design a part of a motor control chain (depending on the chosen subject),
- pilot the realization of the device (give the manufacturer clear instructions for the realization of the device),
- write and test the computer programs necessary for the operation of the device.

Description of the skills acquired at the end of the course

C4 : Have a sense of value creation for his company and his customers
C6 : Be operational, responsible, and innovative in the digital world
C7 : Know how to convince