



2ND AND 3RD YEAR PROJECT-BASED SPECIALISATION

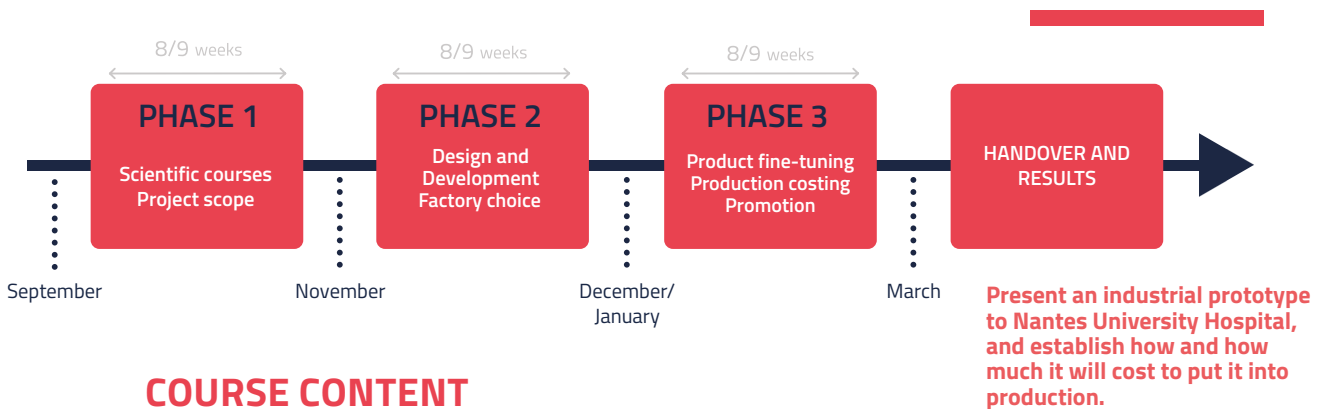
HEALTH, INNOVATION, MANUFACTURING

[SANTIPRO]

The objective of the project carried out by the Health, Innovation, Manufacturing specialisation is to create a simple and autonomous measuring device to monitor hydration levels in the elderly, applicable, in particular, on a large scale in hospitals, using impedancemetry.

The general product concept - which has already been defined via two projects in the Engineering for Health option and for which a Soleau envelope has been filed - consists in developing an armrest, which can be added to accessible toilets in care homes or patients' home, with impedance monitoring integrated into the handrails.

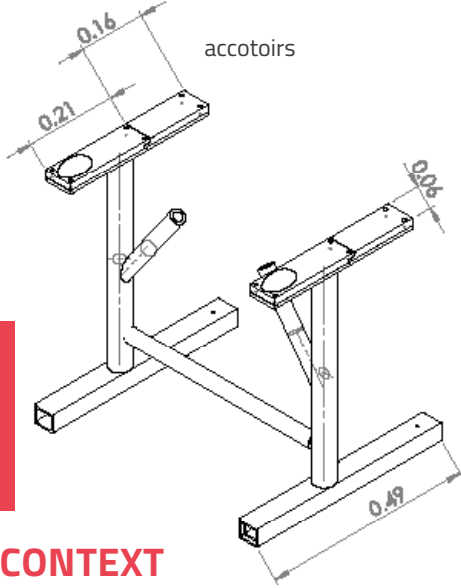
This year, the focus is on putting a prototype into production. Classes will focus on the choice of materials, production methods, sustainable production, and design (mechanical, electronic and IT) for production. To this end, practical work will be carried out at the Jules Vernes Manufacturing Academy.



COURSE CONTENT

The project team will have to develop expertise in the health sector in design, prototyping, materials, IT development (data restitution on an ergonomic application for carers), and entrepreneurship. Course content is therefore geared towards acquiring or furthering these skills:

- > Materials selection in mechanical design
- > Managing and project undertaking
- > Sustainable production
- > Summary: healthcare and impedance
- > Project framing
- > Development and production of a HM interface
- > Process control and industrialisation
- > Factory choice
- > Project: industrialisation, protection and valorisation
- > Expertise on the project
- > Internship



poignée



CONTEXT

Measuring dehydration in the elderly is key to avoiding severe health consequences. However, no simple and inexpensive way to measure patient hydration currently exists.

It is technically possible to physically and precisely measure the distribution of water in different parts of the body, and in particular extracellular and intracellular water excluding fat mass, using impedancemetry.

PROJECT-BASED LEARNING

> The project-based specialisation will be open to a group of 12 students maximum, working almost full-time on the project from September 2023 to March 2024.

The specialisation includes:

- > project work supervised by the programme supervisor
- > scientific courses based on the essential themes to be mastered in order to carry out the project, provided by teachers and external speakers
- > scientific follow-up with by internal and external contributors (Nantes University Hospital).

TEACHING STAFF

The Health and Innovation project-based specialisation is offered in partnership with the Nantes University Hospital and Nantes University, Inserm, Itert and the ITUN, as part of an innovative project led by:

- > Professor Magali Giral (ITUN, Nantes University Hospital)
- > Doctor Sophie Brouard (Inserm)
- > A French firm, specialised in the measurement of patient impedance, will provide support to the Centrale Nantes project team.

HEAD OF SPECIALISATION:

Tugdual Le Neel

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PROJECT PHASES

1. Scope and skills acquisition:

- > Each student is interviewed individually to understand his or her skills and abilities and to jointly define learning objectives
- > The project team defines its governance, scope, schedule and the risks to be monitored
- > The project team follows scientific courses to develop the project

2. Design, development and intellectual property

- > 3D product design, choice of materials
- > Development of the data restitution application for healthcare professionals and the patient,
- > Preliminary work on industrialization design constraints

3. Industrialisation

- > Ordering of materials, assembly and construction of the prototype
- > Calibration, tests and measurements
- > Product definition. Final choice of materials. Definition of manufacturing range. Definition of machine requirements. Workshop implementation.
- > Promotion of the work, communication, interaction and presentation at Centrale Nantes, Nantes University Hospital and to the general public

4. Handover and reporting

- > Finish the industrialisation package: costing
- > Feedback and project follow-up
- > Skills assessment, satisfaction of the project team and partners with the work carried out