Instrumentation and Systems for Health

General information

Module title : Instrumentation and systems for Health
Module identifier : IE.2408

ECTS : 5
Lectures: 24h; Labs: 18h; Project work: 40h
Teamwork : yes (in practical work)

Presentation

The objective of this module is to make students aware of the new needs of the computerization of medical data and techniques in the hospital environment and particularly in improvement of the quality of care and well-being while taking advantage of technological and technical advances in the fields of information technology and telecommunications.

Educational objectives

The specialized skills relevant to the module are listed below :

- Identify current ICT needs in selected hospital environments.
- Identify and analyze constraints related to the use of ICT for medical applications.
- Evaluate technical solutions for a specific need.

The transversal skills relevant to the module are listed below :

- Work as a team during practical sessions.
- Demonstrate rigor and interest in results.
- Listening and being proactive.

Prerequisites

There are no prerequisites.

Content/program

This module details the following aspects :

- The needs of ICT in the field of health and computerization of data and certain types of care in hospital services.
- A state-of-the-art of IT tools, devices, interfaces and methods that are increasingly found in hospitals as well as devices and methods currently being developed. (New medical devices, integrated microsystems for health, smart drugs, imaging and robotics technologies).
- Methods of acquisition and processing of biological signals.

Concepts

The following concepts, whose understanding is an objective of the module, will be adressed:

- The emerging needs of hospital care computerization,
- New medical devices in some hospital departments,
- New advanced technologies for telemedicine (Integrated Microsystems for Health, Smart Drugs, Imaging and Robotics Technologies).
- Biological signal acquisition and processing methods.

Tools used by the teacher/instructor

The teacher/instructor will use the following tools / methods :

- LabVIEW software
- NI Elvis platform

Tools used by the learner

At the end of the module, learners will have learned to use the following tools/methods :

- LabVIEW software
- NI Elvis platform

Subsequent mobilizations at ISEP

This module doesn't require any further mobilization at ISEP.

Pedagogical modalities

Learning methods

Fundamentals are covered in class, combined with lectures with medical professionals.
Instrumentations with LabVIEW software and the Elvis Platform will allow to better understand the problems related to the acquisition and processing of biological signals.

Evaluation procedures

The evaluation of this module is based on paired activities and an individual exam .
Collective evaluation (%) :

- Evaluation of work of the pair (30%).

Individual assessment (%) :

- Final exam in a form ofas MCQs (70%)

Working language

English.

Bibliography - Webography – Other sources

Lectures and topics of Practical Work will be available on Moodle .