

# Artificial organs

**Titulaire**

Antoine NONCLERCQ (Coordonnateur)

**Mnémonique du cours**

ELEC-H503

**Crédits ECTS**

5 crédits

**Langue(s) d'enseignement**

Anglais

**Période du cours**

Deuxième quadrimestre

**Campus**

Solbosch

## Contenu du cours

This teaching unit links all previously acquired knowledge in active medical devices (e.g. bioelectronics, bioinstrumentation, stimulation of excitable tissues, neurology, etc.) to propose to the students a concrete and project-oriented way to design an artificial organ aiming to replace / improve a specific function of an organ.

Students will design, implement, manufacture and assess an artificial organ. A few lectures will give students practical and oriented skills to support them in their design:

- > Introduction
- > Implant Manufacturing and Encapsulation
- > Wireless Implant Powering
- > Implanted Recording and Stimulation
- > Placing a medical device on the EU market

## Objectifs (et/ou acquis d'apprentissages spécifiques)

At the end of this course, the student will be able to:

- > to design, implement, manufacture and assess an artificial organ aiming to replace / improve a specific function of an organ
- > to design a quality system and place a medical device on the EU market

## Méthodes d'enseignement et activités d'apprentissages

The lecture will be oriented to give students skills to design and implement an artificial organ. Students mainly will design, implement, manufacture and assess an artificial organ.

## Contribution au profil d'enseignement

This teaching focuses mainly on the development of the following skills:

- > To measure the physical quantities related to the living, both morphological and functional
- > To translate the constraints of the living into the language of the engineer, anticipate the impact of a development on the living being (choice of materials, processes, etc.)
- > To integrate the normative (certifications), ethical and legal aspects related to biomedical devices and practices, to analyze safety aspects (including radiation protection) and set up quality processes
- > To understand and communicate engineering concepts in English

## Support(s) de cours

Université virtuelle

## Autres renseignements

### Lieu(x) d'enseignement

Solbosch

### Contact(s)

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## Méthode(s) d'évaluation

Autre

### Méthode(s) d'évaluation (complément)

The students will present their project and explain their approach. An oral exam will allow to go deeper in the methodology and course content.

### Construction de la note (en ce compris, la pondération des notes partielles)

The mark will be based on the proposed artificial organ, quality system and product file.

### Langue(s) d'évaluation principale(s)

Anglais

### Autre(s) langue(s) d'évaluation éventuelle(s)

Français

## Programmes

### Programmes proposant ce cours à l'école polytechnique de Bruxelles

MA-IRCB | **Master : ingénieur civil biomédical** | finalité Spécialisée/  
bloc 2 et MA-IREL | **Master : ingénieur civil électricien** | finalité  
Spécialisée électronique et technologies de l'information/bloc 2

