

MICRO-515 **Evolutionary robotics**

Cursus	Sem.	Type
Microtechnics	MA2, MA4	Opt.
Robotics, Control and Intelligent Systems		Opt.
Robotics	MA2, MA4	Opt.

Language of teaching	English
Credits	3
Session	Summer
Semester	Spring
Exam	Written
Workload	90h
Weeks	14
<b>Hours</b>	<b>2 weekly</b>
Courses	2 weekly
<b>Number of positions</b>	

**Remark**

pas donné en 2020-21

**Summary**

NOT OFFERED IN 2020-2021 The course describes theories, methods, and technologies for designing software and hardware systems that are inspired upon natural evolution. It also shows how artificial systems can help to understand biological systems.

**Content**

- Natural and Artificial Evolution
- Evolutionary Computation and Applications
- Evolution of Neural Systems
- Advanced Evolutionary Algorithms
- Evolutionary Robotics
- Developmental Systems
- Evolution of Collective Systems

**Learning Prerequisites****Important concepts to start the course**

Programming skills (Python, Java, C++)

**Learning Outcomes**

By the end of the course, the student must be able to:

- Apply new tools for software and hardware engineering
- Translate acquired theoretical knowledge in practical implementations during laboratory sessions

**Teaching methods**

Lectures, software exercises, and exercises and project involving 3D printing, assembly, programming, and characterization of modular robot with neural controller.

**Expected student activities**

Attending lectures, asking critical questions, taking all exercises and completing assignments for the following week,

forming groups and performing collaboratively project with physical robots, writing and presenting project results

### Assessment methods

Mini-project report/presentation + written exam

### Supervision

Office hours	No
Assistants	Yes
Forum	Yes

### Resources

#### Bibliography

Floreano, D. & Mattiussi, C. (2008) Bioinspired Artificial Intelligence. MIT Press (selected chapters)

#### Ressources en bibliothèque

- [Bioinspired Artificial Intelligence / Floreano](#)