

Industrial Robotics



SCHOOL

Polytech Graduate School of
Engineering



CAMPUS

Belle-Beille



LEVEL

Engineering 5th year



OPEN TO EXCHANGE STUDENTS

Yes



SEMESTER

Fall (S1)

- > **Degree course:** Graduate School of Engineering - Automation and Computer Engineering
- > **Teaching unit:** UE 9.4.1 Voie d'approfondissement syst mes cyber physiques
- > **Course language:** English
- > **Duration (hours):** 32
- > **ECTS:** 2
- > **Teacher(s):** Jean-Louis Boimond

> Assessment:

- Continuous assessment
- Final exam

> Teaching methods:

- | | | |
|---|----------|-------------------------------------|
| <input type="checkbox"/> Lecture course | hours | <input type="checkbox"/> Case study |
| <input checked="" type="checkbox"/> Tutorial course | 20 hours | <input type="checkbox"/> Project |
| <input checked="" type="checkbox"/> Practical work | 12 hours | |

COURSE DESCRIPTION

- Geometric model of a simple chain robot:
- Computation of the direct geometric model
 - Method of Denavit-Hartenberg
 - Example
 - Exercises
 - Inversion of the geometric model
 - Method of Paul
 - Multiple solutions
 - Workspace
 - Aspects

- Trajectories generation:
- Trajectory between 2 points in the articular space
 - Trajectory between several points in the articular space

Programming of robots St ubli RX 90, Fanuc LR and ARC Mate 100 IB, Kuka KR3

OBJECTIVES

Provide a basis for theoretical and practical knowledge in robotics.

PREREQUISITES

Introduction to robotics

SELECTIVE BIBLIOGRAPHY

- 1) Cours de robotique, J. Gangloff, ENSPS 3A, 221 pages
- 2) Robots. Principes et contrôle, C. Vibet, Ellipses 1987, 207 pages
- 3) Robotique. Aspects fondamentaux, J.-P. Lallemand, S. Zegloul, Masson 1994, 312 pages -
- 4) Modélisation et commande des robots, W. Khalil, G. Lebre, Cours E13 Automatique de l'ECN 94/95 -
- 5) Introduction to Robotics Mechanics and Control, 2th edition, J. J. Craig, Addison-Wesley Publishing Company, 1989, 450 pages -
- 6) Modeling, Identification and Control of Robots, W. Khalil, E. Dombre, Hermes Penton Science 2002, 480 pages -
- 7) Robotics Modelling, Planning and Control, B. Siciliano, L. Sciavicco, L. Villani, G. Oriolo, Springer-Verlag 2009, 632 pages -