2A FISA	CU 7.3
Semester 7	3 School ECTS - 3 Company ECTS

CU 7.3: INNOVATION & RETRO-ENGINEERING (Robotics)

Director of studies: Anis BOUALI

General CU objectives:

– Describe, and analyse the operation of a robot
– Study the mechanical and electrical elements of robots
– Perform simulations
– Create robot programs for simple application
– Launch, monitor and supervise a robotic production
– Organise production
– Prepare instruction documents
– Manage a project from the idea to the industrial prototype.
– Prepare for the industrialisation of new products.

Consists of:

- Module 1: Introduction to robotics
- Module 2: Not applicable
- Module 3: Not applicable
- Industrial assessment

Hourly volume

In-person	*Self-directed study*
10.50 H Lectures	**36.00 H**
10.00 H Tutorials	
28.00 H Practicals	

Positioning of the CU in the School reference system:

Units of skills
In accordance with the RNCP sheet

Updated on 25 April 2025

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Module 1: Introduction to robotics	**Coefficient 1**
Session leaders: Anis BOUALI, Guillaume DEMESURE, Marc JAFFRES	
Teaching assistants: Julien LALLEMAND	
Prerequisites: CU 5.2, CU 5.5 and CU 6.5	
Teaching materials: Course notes – Presentation slides – Reading list – Reference book – Files	
Assessment methods: individual and in groups In-class exam– File	

Learning outcomes	**Description**	**Number of student hours (in-person)**		
		Lectures	**Tutorials**	**Practicals**
At the end of this course, the student must be able to describe, model, analyse and control a handling robot. At the end of this module, students will be able to: – Program a robot according to the different modes: online and offline. – Choose suitable trajectories in relation to a given application – Manage the notions of collision and singularity – Choose a grip mode adapted to an application	Introduction to robotics: Definitions, news in robotics, robots and industry, robot typologies. Robotics / electrical technology: actuators and sensors for robotics (to extend beyond the commercial positioning)– Read, understand and interpret technical documentation for a robot. Modelling of a handling robot Understand and use the description conventions and modelling of a robot. Geometric, kinematic and dynamic description.	8.75	10.00	8.00
	Through several robotic cells, students will have to program a robot to carry out a certain number of tasks in accordance with precise specifications imposing a: – Working environment (conveyor belt, pallet, various machines, etc.) – Grip mode or modes – Rate objective (optimisation of cycle times)			8.00
At the end of this module, students will be able to: – Program a robot – Choose suitable trajectories in relation to a given application – Manage the notions of collision and singularity	Through robotic cells, students will have to program a robot to carry out a certain number of tasks in accordance with specifications imposing a work environment (storage, machines, machining, etc.).	1.75		12.00
		10.50	**10.00**	**28.00**

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Industrial **assessment**
Session leaders: Apprenticeship supervisor (in company), Academic tutor, Pierre-Jean MÉAUSOONE
Teaching assistants:
Prerequisites:
Teaching materials: Company documents
Assessment methods: individual Viva– Report

Learning outcomes	**Description**	**Number of student hours (in-person)**		
		Lectures	**Tutorials**	**Practicals**
Carry out production tasks: Prepare materials and resources necessary for production. Communicate information to production. Organise production. Validate the process technically and economically. Improve production quality.	The project consists of making a product or a construction or part of a construction in a group. To do this, the apprentice will have to prepare and configure: – means of production – production tools (machining, assembly, finishing, etc.) – the means of control. They may manufacture all or part of the elements of the assembly to be produced. They will ensure the control and possibly the installation. Note: the project must be related to the company's activity.			
		0.00	**0.00**	**0.00**