

INCOBOTICS 5.0 – Ready for Industry 5.0

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CHALLENGE

Draw a robot

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Coordinator: POLITEKNIKA IKASTEGIA TXORIERRI S.COOP



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1. THE CHALLENGE

For this challenge you must complete the "incobotics" logo using the modules and functions previously studied by programming on SRS software.

The robot takes a felt pen on its support and draws the Incobotics robot on the frame.

The robot will start its program at a starting point. At the end of the cycle, he will have to return to it's initial point.

At the end of the cycle, the robot puts the felt pen back in its place.

INCOBOTICS →





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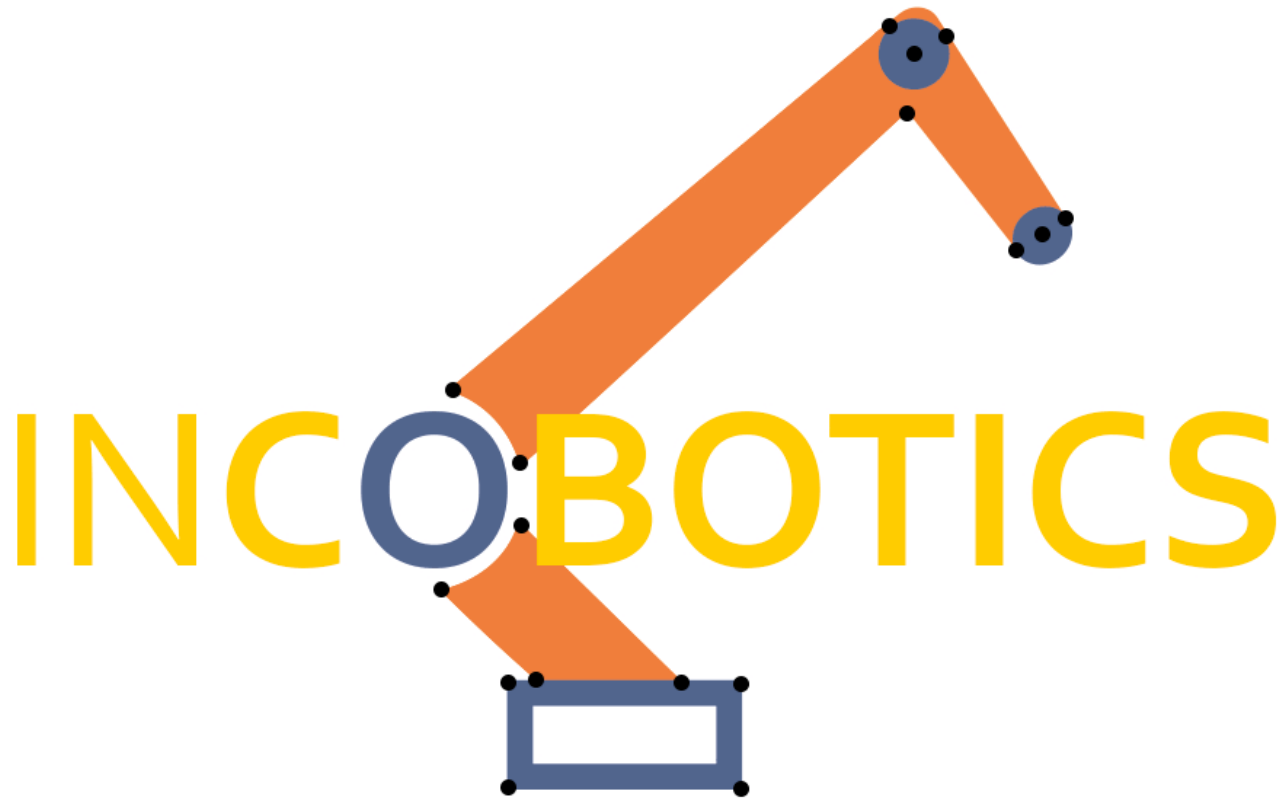
apro»



UIMM
LA FABRIQUE
DE L'AVENIR



You can use the following picture to program and define the various points



2. LEARNING RESULTS - EVALUATION CRITERIA

LO	Explanation	Value
LO-1	Comprehend the CO-BOTS major brands available on the market	
LO-2	Choose the characteristics of the robot. Define the Cobotique system, select and connect the components. Make the design of the pen support.	5
LO-3	Program the robot, using programming and data processing techniques.	20
LO-4	Check the operations of the robot, adjust the control devices and apply the safety rules.	10
LO-5	Configure the artificial vision system, select and connect the elements and components.	
LO-6	Program the artificial vision system to be used with the robot.	



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3. REQUIREMENTS (SPECIFICATIONS)

Short description

1. GENERAL TECHNICAL CONDITIONS OF THE CHALLENGE	
1	Choose the collaborative robot that will be used to carry out the process according to the specifications
2	Use a start button to start the machine cycle. A green light will light up during the operating time.
2. CONDITIONS OF THE DOSSIER FORMAT	
1	It will be delivered in digital format (PDF)
2	The documents should include the requirements for each module and will have the following structure: Cover, Index, Dissertation and Bibliography.
3	The cover page includes: the challenge and its photo, the group members, the group number, the session and the modules.
4	Contents and numbered pages
5	Writing font size 12.
6	Well-numbered and organized titles
7	Well-defined bibliography.
3. CONDITIONS OF THE PRESENTATION	
1	The presentation aims to expose, explain and justify the challenge as best as possible.
2	Each team will have a maximum of 10 minutes for the presentation.
3	The teaching staff will not specify the order of intervention of the teams in advance.
4	The order of intervention of each member will be carried out by the teaching staff "in situ and live"
5	Team members must be able to explain the challenge in its entirety.
6	The use of correct and appropriate technical expressions will be valued.
7	The defence must be fluid and not monotonous.
8	Do not read the content, be well organized and personal remarks will be appreciated.
9	If questions are asked, all members should be able to answer.
10	The presentation format is not imposed. It is the initiative of the working group.
11	It is suggested that the text should be reduced as much as possible
12	It is suggested to use visual resources; images, graphics, animations, etc.

4. BASIC CONTENT

KNOWLEDGE AND SKILLS

LO-2	Choose the characteristics of the robot. Define the Cobotic system, select and connect the components. Make the design of the gripping hand.
Knowledge	The TCP configuration
Knowledge	The characteristics of entry and exit systems
Knowledge	Good knowledge of SolidWorks
Skills	Mounting and connecting the clamp and/or suction cup
Skills	Using SRS software
LO-3	Program the robot, using programming and data processing techniques.
Knowledge	The programming of the different movements (movej, movel, movec) and approach
Knowledge	The SRS software
Knowledge	Setting up and assigning IOs
Skills	Structured programming
Skills	The instructions
Skills	Variables
Skills	The use of the system's IOs
LO-4	Checks the operation of Cobot systems, adjusting the control devices and applying safety regulations.
Skills	Learning points and trajectories
Skills	Optimize the running time of a cycle
Skills	Follow safety rules
Skills	Locate and recognize potential installation and programming errors



TRANSVERSAL

In addition, the challenge will work on crosscutting aspects that teachers evaluate according to the corresponding rubric:

1. Personal (Planning, Involvement.)
1. Teamwork.
2. Communication (written and oral).

In addition, the challenge will work on Soft Skills aspects that the students will evaluate:

1. Co-evaluation of teamwork (which includes valuing teammates at work).
2. Self-evaluation of teamwork (which includes self-improvement in the team).

5. GET THE INFORMATION (and seminars)

Resources

We have the following resources:

- Computers with Drive for shared work and completion of files and presentations.
- The TX2-60, TX2-60L and TX2-60L Touch robots
- Robot manuals
- Information [de www.incobotics.eu](http://www.incobotics.eu)
- Bibliography

Seminars

SEMINAR	Manual movements
HOURS / SESSIONS	4 h
TEACHERS / SPECIALISTS	Bernard Cardenas - Frédéric Bissonnier
CONTENT	Manual movement in "Joint," "Frame" and "Tool" modes.

SEMINAR	Learning points and trajectories
HOURS / SESSIONS	2 h
TEACHERS / SPECIALISTS	Bernard Cardenas - Frédéric Bissonnier
CONTENT	Point learning and program transfer



SEMINAR	Movement programming
HOURS / SESSIONS	8 h
TEACHERS / SPECIALISTS	Bernard Cardenas - Frédéric Bissonnier
CONTENT	<ul style="list-style-type: none"> • Using SRS • Movej, movel et movec • Gripper • Instruction "Approach" • The "Reach" and "Leave" functions

6. EVALUATION OF RESULTS

HOMOGENIZATION				TRANSVERSAL							TECNICAS						
SOFT SKILLS	SKILLS	KNOWLEDGE	TOTAL	SOFT SKILLS							SKILLS			KNOWLEDGE		MINIMUM	
				AUTONOMY	PLANNING	TEAMWORK	WRITTEN COMMUNICATION	ORAL COMMUNICATION	SELF-EVALUATION	CO-EVALUATION	DOSSIER	ACTIVITIES	FINAL PRODUCT	DEFENDING	EXAM	MINIMUM DOSSIER	MINIMUM EXAM
25	40	35	100	5	2	4	5	5	2	2	15	15	10	10	25	5	5

7. TIMING

Duration : 42 sessions			
1	Sessions	1	Present the challenge to the students
14	Sessions	15	Obtaining the information included visits to the facilities, giving seminars and training activities.
10	Sessions	25	Offline programming, testing and assembly
7	Sessions	32	Preparing documentation until planned tasks are completed. Completion of the "Dossier." During the execution, feedback with the teams.
1	Sessions	33	Presentation, defence, co-assessments and self-assessment will be carried out.
1	Sessions	34	Final feedback

CONCLUSION

Conclude once the whole challenge is finished.

