Colegiul Național Pedagogic „Constantin Cantacuzino” Târgoviște

Subject : ROBOSTART
Teacher : Căpraru Claudiu-Ionuț
Class: a IX-a D
School Year : 2024-2025, 36 weeks
Nr. ore: 1 oră/săptămână

Avizat director,
Prof. Mareș Silvia

Calendar Plan

Learning Unit	Specific Competencies	Contents	No. of Hours	Period	Remarks
Introduction to Robotics	1.1. 1.2.	History of robotics: - what cybernetics deals with; - what a robot is; - evolution of robots; - robots in our lives	1	Week 1	
	1.2.	Types of robots: - classification of robots; - fields of use; - robot missions; - future robots	1	Week 2	
	1.2.	The laws of robotics	1	Week 3	
Construirea roboților	1.3.	Functional schematic of a robot: - control unit; - information acquisition unit; - information extraction unit; - actuator unit; - locomotion unit	4	Week 4- Week 7	
	1.3.	Physical structure of a robot: - support structures; - locomotion systems: motors, transmissions, propellers;	2	Week 8- Week 9	

		- execution elements: destination, motors, servomotors, motor control, electromagnets, robotic arms, handling devices, gripping devices, control of execution elements; - power sources; - sensors: destination, active/passive sensors, working principles, ultrasonic/tactile/sound/light/color/spatial orientation sensors, smart servomotors; - control units; - connection elements			
	1.4.	Compliance with environmental protection and workplace safety rules	1	Week 10	
Programming Robots	2.1.	Simulation and testing environments: - purpose, interface; - project management; - managing connections between robot control units and personal computers; - setting up robot control unit components; - uploading control programs to robot control units	3	Week 11- Week 13	
		School in a Different Way	1	Week 14	
	2.1. 2.2.	Graphic programming concepts: - action blocks; - sensor blocks; - control flow blocks; - purpose of blocks; - block management; - setting parameters; - block chaining; - nesting blocks	3	Week 15- Week 17	
	2.2.	Linear algorithms for robot control: - concept of linear algorithm; - blocks used in programming linear algorithms; - setting parameters for action blocks	3	Week 18- Week 20	
	2.2.	Decision-making algorithms for robot control: - concept of decision algorithm;	3	Week 21- Week 23	

		- blocks used in decision algorithm programming; - setting parameters for sensor and control flow blocks			
	2.2.	Repetitive algorithms for robot control: - concept of repetitive algorithm; - blocks used in repetitive algorithm programming; - setting parameters for blocks	3	Week 24- Week 26	
Solving Real-Life Problems with Robots	3.1.	Real-life problems that can be solved using robots	5	Week 27- Week 31	
		Green Week	1	Week 32	
	3.2.	Learning activities with robots	3	Week 33- Week 35	
Review	2.1., 2.2., 3.1.	Yearly review	1	Week 36	

General and Specific Competencies

1.1. **Integration of knowledge from math, physics, and computer science for the purpose of designing, building, and programming robots**
1.2. Identification of concepts, phenomena, relationships, and processes specific to robotics
1.3. Identification of situations in which robots can be used according to their type
1.4. Understanding basic concepts in robotics and building simple robot models
1.5. Observance of environmental protection and workplace safety rules
2. Creative programming of robots using an appropriate programming environment
2.1. Understanding a simulation and testing environment for robot activity
2.2. Programming control algorithms for robots
3. Solving real-life problems with the help of robots
3.1. Identifying real-life problems that can be solved using robots
3.2. Initiating learning activities with robots