

Curriculum - Robo Beginners (Level 1)



	Topics	Learning Outcome	Assessment %
1.0	Introduction to Robotics 1.1 Origins 1.2 Robotic applications and uses (3D's) - Yesterday, today, and tomorrow 1.3 Robot building blocks and interfaces 1.4 Robotic functions (Sense, Decide, Act) 1.5 Robotic actions (Locomotion, Navigation) 1.6 Advantages, disadvantages, and laws of robotics 1.7 Video - Robots in use	Understanding on the use and benefits of robots	
2.0	Introduction to robot platform - Hardware 2.1 Controller 2.2 Motors 2.3 Sensors 2.4 Mechanical parts 2.5 Electrical interconnections 2.6 Project - Robot construction	Robot design principles, Spatial design concepts, creative thinking, and robot construction techniques.	
3.0	Introduction to programming 3.1 Flowcharting techniques & pseudo-code 3.2 Programming - Use of "Move" & "Motor" Block to control robot	Programming with NXT-G	
4.0	Project - Series 1 4.1 Straight driver 4.2 Circle 4.3 Square	Robot navigation, calculation of wheel circumference	10%
5.0	Project - Series 1 5.1 Figure of eight 5.2 Diamond 5.3 Talking robot	Robot navigational skills focussed on accuracy, Geometric movements, turn vs. spin, interdependence of distance and steering for turns.	15%
6.0	Soft skill development - Presentation project	Development of presentation skills and techniques	25%
7.0	Project - Series 2 7.1 Karate chopper 7.2 Footballer	Robot arm design and prototype development, object manipulation, testing, and corrective actions.	10%
8.0	Project - Series 2 8.1 Pallet lift and placement without load 8.2 Pallet lift and placement with load	Object and load manipulation techniques, speed vs. accuracy, Center of Gravity and it's effects on robot handler design.	10%
9.0	Project: Determination of Speed through graphical techniques 9.1 Distance vs. Time Graph 9.2 Distance vs. Displacement 9.3 Speed vs. Velocity 9.4 Introduction to Scalars and Vectors	Introduction to concepts of scalars and vectors, Data collection and analysis, Graphing skills.	20%
10.0	Introduction to Sensors 10.1 Sound 10.2 Touch 10.3 Ultrasonic 10.4 Programming with "Sound" block	Function and use of sensors, sensor placement, sensor programming techniques, audible and inaudible frequencies, construction and operation of electrical switches. Use of Sound block to convey messages and play music through the Controller.	
11.0	Project - Series 3 11.1 Maze Bot 11.2 Security Guard Mouse Catcher	Construction and programming of Robots with sensors, obstacle avoidance and object detection techniques.	10%