

SYLLABUS ECCC

MODULE: **CS M4** ROBOT PROGRAMMING

LEVEL: **MEDIUM (B)**

The examination of this module includes all issues from basic (A) extended to the competences set out below.

GROUP OF COMPETENCE	COMPETENCIES WITHIN THE ECCC STANDARD
1. Input and output data – Data Link	1.1. Input data 1.2. Output 1.3. Data link
2. Advanced input devices	2.1. Sound Sensor 2.2. Tilt Sensor 2.3. Temperature Sensor 2.4. Turn Sensor 2.5. The magnetics sensor 2.6. NXT buttons
3. Blocks for advanced input devices	3.1. Sound sensor block 3.2. Tilt Sensor block 3.3. Acceleration sensor block 3.4. Temperature sensor block 3.5. Rotation sensor block 3.6. Magnetic sensor block
4. Output devices	4.1. Sound signals 4.2. Light signals 4.3. NXT screen
5. Output signals editors	5.1. Image Editor 5.2. Sound Editor
6. Creating programs using advanced environmental block NXT-G	6.1. Mathematical operations block 6.2. Logic operations block 6.3. Comparison Block 6.4. Range block 6.5. Pseudorandom function block 6.6. Constant block 6.7. Variables block
7. Sample issues in advanced robots programming	7.1. Setting the start position 7.2. Security of robot before auto-destruction 7.3. Multithreading
8. Kinematics and mathematical description of the robot	8.1. Linear velocity 8.2. Angular velocity 8.3. Robot kinematics 8.4. Workspace and degrees of freedom
9. Movement – structures and modalities	9.1. Wheel constructions 9.2. Worm constructions 9.3. Walking constructions
10. Remote-controlled circuits	10.1. Communication

Preferred development environment for the implementation of the basic-level tasks::

- LEGO Mindstorms Software NXT-G

Required equipment:

- LEGO Mindstorms 2.0
- A computer with a minimum 1GHz processor with Windows XP or later