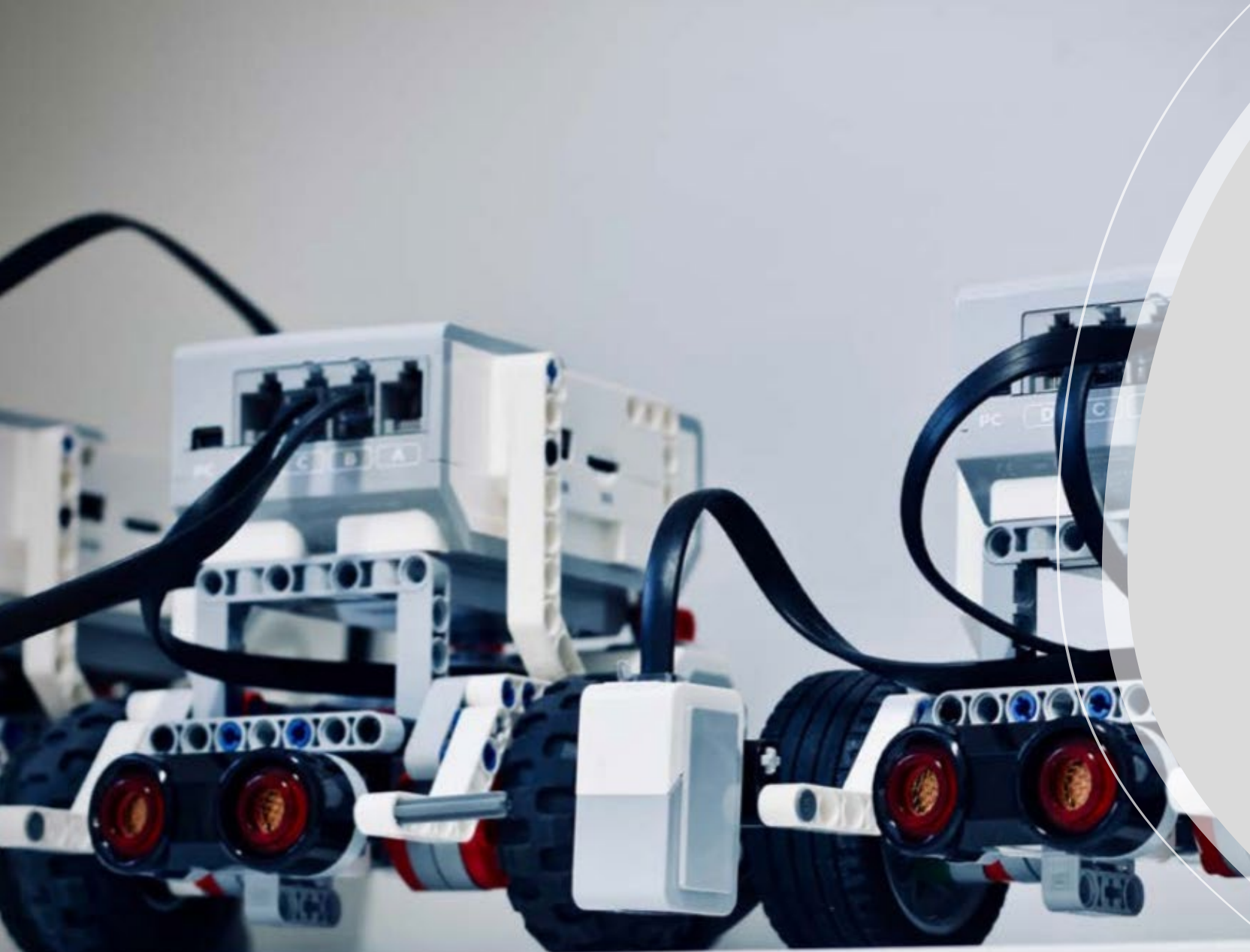# Robotics

- Level 1 qualification

- Aimed at the younger learner aged around 10 – 11 years old.

Introduction

- *''Robotics inspires a lifetime love of learning, creativity and logical reasoning that are critical to success in an ever-changing workforce. Educational institutions are key players in introducing robotics to students in an engaging way and teaching skills that will be necessary in many of the jobs that today's students will occupy.''*

- Diana Aldea, Marketing & Advertising Specialist, Shape Robotics
  https://www.fenews.co.uk/featured-article/28138-how-teaching-robotics-can-tackle-the-lack-of-stem-skills-in-the-uk

MODULES AND MAIN LEARNING OUTCOMES

Modules
Robotic concepts
Robotics parts
Simple control system
Visual programming
Working with robots

Main learning outcomes
- Build confidence to build and programme a robot using widely available robotics kits and visual programming language.
- Understand key concepts relating to robots and robotics systems.
- Identify examples of robots and the main parts of a robot and their function.
- Understand the elements of a simple control system and how to test it.
- Understand basic programming concepts and visual programming language.
- Set up a robot, implement robotic motion and control a robot in an environment.

TECHNICAL DETAILS

Recommended GLH: 37 hours and recommended TQT: 51 hours

The assessment is split into two parts.

First part:
- Offline robotics skills demonstration test.

Second part:
- 45-minute online test with 28 questions
- Pass mark is set to 75% and over (that's a score of at least 21 marks out of a possible 28)

- A Learner must pass the offline robotics skills demonstration test and pass the online test to achieve the qualification.

- Other resources
  - Syllabus, Diagnostic test, Learner material eBook, Teacher eBook, ICDL Robotics Assessment handbook, ICDL Robotics Skills Demonstration Record.

- Pricing
  - The registration, courseware (e-Books), live test and certificate will cost £23.50. Any diagnostic papers come at an additional cost.

ROBOTS: HARDWARE AND SOFTWARE REQUIREMENTS

The learning materials are designed to be used with a set of technologies. In order to complete the lessons as outlined in the Teacher materials eBook, it is recommended that you have the following in your classroom, although it is possible for you to adapt the learning materials and activities to other technologies if you wish:

mBlock5 software
mBlock 5 software is a block-based and text-based programming software based on Scratch 3.0. It allows users to create games, animations and program Makeblock robots, Arduino boards, and micro:bit.
The software is free and it works across Windows, Mac, Chromebook and mobile devices. It is available for download at:

https://www.mBlock.cc/en-us/download/

The software is also available on the web at:

https://ide.mBlock.cc/?device#/

For Android and iOS users, the software is available for download at any app store.

Robot kit

The robotic kit used in this module should be supported by the mBlock 5 program. The robotic kit used in the modules in the Teacher eBook is the MBot Robot ranger. Details about the robotic kit can be found at

https://www.makeblock.com/project/ranger

Other compatible robotic kits may be used and they must include the following parts:

Wheels for movement

Sensors: light, sound, ultrasound, infrared-light (line follower) sensor

Output devices: LED lights
The robotics kit, (unless teachers are using their own existing kits) need to be purchased and we advise that the kits that are purchased are supported by the mBlock5 programme. In short, meaning no physical robotics components are provided as part of the qualification

LEARNER MATERIAL EBOOK

Practice the Concept:

Work in groups of two or three and identify an example of the use of a robot in the following environments:

ENVIRONMENT	AN EXAMPLE OF USE
School	
Manufacturing	
Healthcare	

Introduction

What is a robot? Are you able to identify a robot when you see one?

Examine the following images and check in the white box at the lower right-hand corner of the image if you think that the image shows a robot.

In this unit, we will learn about the basics of robots and robotic systems and their applications.

1 System Requirements

The following system requirements are for **in-application testing only**, should any more information be required please contact support@skillsbox.com

1.1 Requirements

- Microsoft Windows 7/8/10
- Download speeds of at least 512Kbit/s per user are required with no less than 10 Mbit/s of total capacity
- 1920x1080 pixels with 16k colours*
- .NET 3.x this must be enabled via https://docs.microsoft.com/en-us/dotnet/framework/install/dotnet-35-windows-10

This resolution will ensure all content will be displayed on-screen for all tests, the minimum screen resolution is dependant on the test content being delivered, in many cases a smaller resolution may be used.

1.2 Supported Browsers

- Internet Explorer 11
- Google Chrome*
- Firefox*

only the latest versions are supported

1.3 Supported Microsoft Office Versions

- **Microsoft Office O365 Desktop** Home and Student; Home and Business; Standard; Professional; Professional Plus*
- **Microsoft Office 2019** Home and Student; Home and Business; Standard; Professional; Professional Plus*
- **Microsoft Office 2016** Home and Student; Home and Business; Standard*

Office 365 is only supported with a "*Full, local installation*"

2 Systems checklist

System Check	Requirements	Additional Information
Operating System	Windows 7/8/10	Only Microsoft Windows is supported for in-application testing
Browser	Internet Explorer 11 Firefox* Google Chrome*	A plugin is required for in-application testing
Plugin installation	PSI in-application Plugin is required for tests	**All Supported Browsers:** Ensure the plugin is fully installed and detected. **Additional Chrome Requirements:** Ensure the extension has been installed **Additional Firefox Requirements:** Ensure the Firefox extension and the plugin are installed
.NET Framework	.NET 3.X Framework is required	.NET 3.X framework is required for applications to run**
Microsoft Office	Microsoft Office applications must be installed.	In-application testing will not work with browser versions of Office365
Access to work files (Z:/)	Skillsbox Atlas Cloud uses a drive mapping script to create Z:/ on the machine to store test files	The mapped drive must be visible to candidates if there is already a Z:/ drive on the network the script will work backwards to find the next available letter to map the drive to.
Registry Access	User must have read/write access to HKEY_CURRENT_USER	This is default in Windows

only latest versions are supported

**follow this link to enable .NET 3.5 https://docs.microsoft.com/en-us/dotnet/framework/install/dotnet-35-windows-10

T: 01793 417445

E: BCSSALES@BCS.UK

HTTPS://WWW.BCS.ORG/DELIVER-AND-TEACH-QUALIFICATIONS/TEACHERS-SCHOOLS-AND-COLLEGES/TEACH-OUR-DIGITAL-LITERACY-QUALIFICATIONS/TEACH-BCS-LEVEL-1-ROBOTICS-AWARD/

THANK YOU