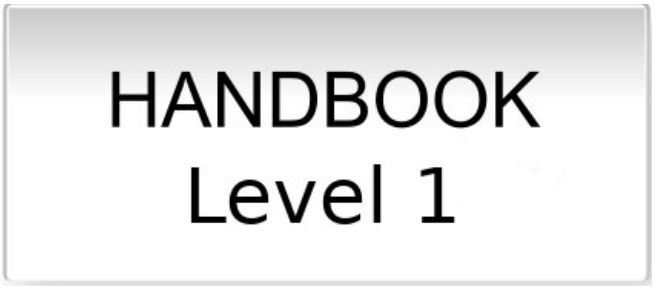
Smart Tech Qualifications and Information

For this qualification TLM recommend the excellent teaching resources and support offered by Black Country Atelier.

Further information can be found here [1].



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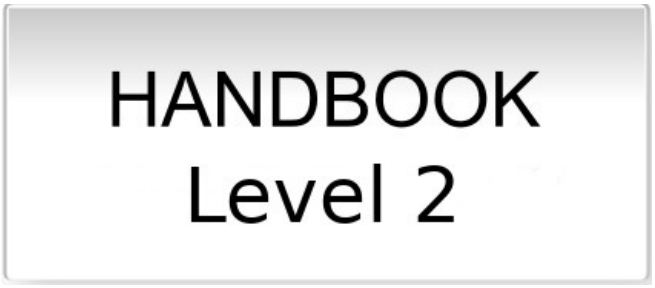

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Level 1

Level 1, Unit 1 - Product design and visualisation (5 credits)

1. relate opportunities and constraints to a product design.	2. visualise product solutions to meet identified needs.	3. present evaluations of designs.
1.1 identify opportunities for a product or solution. [5]	2.1 identify key aspects in a design brief. [6]	3.1 collect evidence for presenting the design. [7]
1.2 identify constraints on a product or solution. [8]	2.2 gather information to develop a solution. [9]	3.2 present strengths and weaknesses in a visual prototype. [10]
1.3 consider commercial sustainability of a product	2.3 design and test sketches and models to	3.3 use appropriate digital and/or physical models to

or solution. [11]	visualise a solution. [12]	support presenting a design. [13]
	2.4 use appropriate digital and physical media to design a product. [14]	3.4 receive feedback from presenting a design. [15]
	2.5 prepare a visual prototype of the solution. [16]	3.5 act on feedback to improve a design. [17]

Level 1, Unit 2 - Product manufacture (5 credits)

1. relate a product's design to its manufacture.	2. use tools and information to support the manufacturing process.	3. present an evaluation of manufacturing processes.
1.1 check quality in a design in preparation for manufacture. [19]	2.1 select the tools needed for manufacture. [20]	3.1 collect evidence for presenting the manufacturing process. [21]
1.2 use scale and dimensions to associate plans with manufacture. [22]	2.2 prepare information to manufacture a product. [23]	3.2 present strengths and weaknesses in the manufacturing process. [24]
1.3 prepare and document files to support the process of moving from design to manufacture. [25]	2.3 use manufacturing tools with appropriate precision and attention to safety. [26]	3.3 use appropriate digital and/or physical drawings or models to support a presentation of the manufacturing process. [27]
1.4 make adjustments to a design as a result of feedback from the manufacturing process. [28]	2.4 fabricate a product using appropriate materials and settings. [29]	3.4 receive feedback from presenting the manufacturing process. [30]
	2.5 finish or assemble parts and components. [31]	3.5 act on feedback to improve work. [32]
	2.6 identify and correct errors to make improvements to work. [33]	

Level 1, Unit 3 - Smart electronics (5 credits)

1. understand analogue circuits.	2. understand digital control.	3. combine analogue and digital systems.
1.1 identify circuit components and symbols. [35]	2.1 identify digital circuit components. [36]	3.1 identify a trigger point in a changing voltage. [37]
1.2 identify valid circuits. [38]	2.2 identify program elements that control physical components. [39]	3.2 follow instructions to build a Smart system. [40]
1.3 set up a physical analogue circuit for a purpose. [41]	2.3 debug a control program to get it working. [42]	3.3 use a program to control a physical system. [43]
1.4 distinguish between analogue and digital products. [44]	2.4 use switches to control actions. [45]	3.4 combine Smart technology in a design to improve the user experience. [46]

Level 2

Level 2, Unit 1 - Product design and visualisation (5 credits)

1. relate opportunities and constraints to a product design.	2. visualise product solutions to meet identified needs.	3. present evaluations of designs.
1.1 describe opportunities for a product or solution. [48]	2.1 explain key aspects in a design brief. [49]	3.1 organise evidence for presenting the design. [50]
1.2 describe constraints on a product or solution. [51]	2.2 gather information to develop a solution. [52]	3.2 explain strengths and weaknesses in a visual prototype. [53]
1.3 consider commercial sustainability of a product or solution. [54]	2.3 design and test sketches and models to visualise a solution. [55]	3.3 use appropriate digital and/or physical models to support presenting a design. [56]
	2.4 use appropriate digital and physical media to design a product. [57]	3.4 receive feedback from presenting a design. [58]

	2.5 prepare a visual prototype of the solution. [59]	3.5 act on feedback to improve a design. [60]

Level 2, Unit 2 - Product manufacture (5 credits)

1. relate a product's design to its manufacture.	2. use tools and information to support the manufacturing process.	3. present evaluation of manufacturing processes.
1.1 check quality in a design in preparation for manufacture. [62]	2.1 select the tools needed for manufacture. [63]	3.1 organise evidence for presenting the manufacturing process. [64]
1.2 work with scales and dimensions when associating plans with manufacture. [65]	2.2 prepare and plan information for the manufacturing a process. [66]	3.2 explain strengths and weaknesses in the manufacturing process including economic and environmental considerations. [67]
1.3 prepare and document files to support the process of moving from design to manufacture. [68]	2.3 use manufacturing tools with appropriate precision and safety. [69]	3.3 use appropriate digital and/or physical models to support a presentation of the manufacturing process. [70]
1.4 make adjustments to a design as a result of feedback from the manufacturing process. [71]	2.4 fabricate a product using appropriate materials and settings. [72]	3.4 receive feedback from presenting the manufacturing process. [73]
	2.5 finish or assemble parts and components. [74]	3.5 act on feedback to improve my work. [75]
	2.6 explain how to correct errors to make improvements to work. [76]	

Level 2, Unit 3 - Smart electronics (5 credits)

1. understand	2. understand digital	3. combine analogue

analogue circuits.	control.	and digital systems.
1.1 describe the purpose of circuit components and symbols. [78]	2.1 describe the purpose of digital circuit components. [79]	3.1 describe the process of analogue to digital conversion. [80]
1.2 build valid circuits. [81]	2.2 create program elements that control physical components. [82]	3.2 build a Smart system. [83]
1.3 set up and debug a physical analogue circuit for a purpose. [84]	2.3 explain bugs in a control program and get it working. [85]	3.3 explain how to use a program to control a physical system. [86]
1.4 explain the difference between analogue and digital products. [87]	2.4 use logic to control actions. [88]	3.4 combine Smart technology in a design to improve the user experience. [89]

Links
[1] http://www.blackcountryatelier.com/
[2] https://theingots.org/community/sites/default/files/uploads/user4107/Smart%20Product%20Design_Spec_L1_L2_Spec_BCA_TLM_2019-v1.1.pdf
[3] https://register.ofqual.gov.uk/Detail/Index/34052?category=qualifications&query=TLM%20Level%201%20Certificate%20In%20Smart%20Product%20Design%20and%20Manufacture
[4] https://register.ofqual.gov.uk/Detail/Index/34062?category=qualifications&query=TLM%20Level%202%20Certificate%20In%20Smart%20Product%20Design%20and%20Manufacture
[5] https://theingots.org/community/spl1u1x#1.1
[6] https://theingots.org/community/spl1u1x#2.1
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[26] https://theingots.org/community/spl1u2x#2.3

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[27] https://theingots.org/community/spl1u2x#3.3
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