Bournemouth University

KEY PROGRAMME INFORMATION

Originating institution(s) Bournemouth University	**Faculty responsible for the programme** Faculty of Science and Technology
Final award(s), title(s) and credits MSc Internet of Things – 180 credits (90 ECTS)	
Intermediate award(s), title(s) and credits PGDip Internet of Things – 120 Credits (60 ECTS) PGCert Computing– 60 Credits (30 ECTS)	
UCAS Programme Code(s) (where applicable and if known) N/A	**HECoS (Higher Education Classification of Subjects) Code and balanced or major/minor load.** 100365 - Computer Networks (major), 100373 - Internet Technologies (minor) 100367 - Computing and Information Technology (minor)
External reference points The UK Quality Code for Higher Education; Chapter A1: The National Level (incorporating the Framework for Higher Qualifications (FHEQ) in England, Wales and Northern Ireland); Chapter A2: The Subject and Qualification Level (incorporating the Subject benchmark statements for Computing (2015));	
Professional, Statutory and Regulatory Body (PSRB) links N/A	
Places of delivery Bournemouth University, Talbot Campus	
Mode(s) of delivery Full-time/Part-time	**Language of delivery** English
Typical duration Full-time 12 months Part-time 24 months	
Date of first intake September 2019	**Expected start dates** September and January
Maximum student numbers N/A	**Placements** 30 weeks, optional
Partner(s) Not applicable	**Partnership model** Not applicable
Date of this Programme Specification March 2019.	
Version number 2.0-0920	
Approval, review or modification reference numbers E20181916 EC 1819 33	

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Programme Award and Title: MSc Internet of Things

Stage 1/Level 7
Students are required to complete 4 core units and choose 2 optional units

Unit Name	Core/ Option	No of credits	Assessment Element Weightings			Expected contact hours per unit	Unit version no.	HECoS Code
			Exam 1	Cwk 1	Cwk 2			
Wireless Sensor and Actuator Networks	Core	20	-	100%		30	2.0	100365; 100367 (balanced)
Mobile and Wireless Networks	Core	20	-	100%	-	30	1.0	100373; 100367 (balanced)
Research Methods & Professional Issues	Core	20	-	100%	-	30	2.0	100962 (major), 101090 (minor)
Security and Privacy in Internet of Things	Core	20	-	100%	-	30	2.0	100365; 100376 (balanced)
Cloud Computing	Option	20	-	100%	-	30	1.0	100365 (minor) 100367 (major)
Blockchain and Digital Futures	Option	20	-	100%	-	30	1.0	100376 (major); 100755 (minor)
Human Centred Design	Option	20	-	100%	-	30	1.0	100736 (major), 100753 (minor)
Smart Systems	Option	20	-	100%	-	30	1.0	100359 (Balanced) 100373 (Balanced)

Progression requirements: Requires 120 credits at Level 7

Exit qualification:
PG Cert MSc Internet of Things requires 60 credits at Level 7 (any 60 credits out of these units).

PG Dip MSc Internet of Things requires 120 credits at Level 7 (completion of all core units and 2 optional units).

Placement: Optional placement in commerce/industry. Non-credit bearing.

Stage 2/Level 7
Students are required to complete the Masters Project.

Unit Name	Core/ Option	No of credits	Assessment Element Weightings			Expected contact hours per unit	Unit version no.	HECoS Code
			Exam 1	Cwk 1	Cwk 2			
Individual Masters Project	Core	60	-	100%	-	10	1.0	100367 (major) 100962 (minor)

Exit qualification
MSc Internet of Things requires 180 credits at level.

AIMS OF THE DOCUMENT

The aims of this document are to:

- define the structure of the programme;
- specify the programme award titles;
- identify programme and level learning outcomes;
- articulate the regulations governing the awards defined within the document.

AIMS OF THE PROGRAMME

Internet of Things is an emerging computing and networking paradigm that provisions the massive and seamless integration of everyday devices and automations into the Internet. This seamless integration allows to automatically capture data from and communicate with embedded devices and objects, thus enabling the design and development of more efficient and safe cyber-physical systems. IoT is a key enabling technology for broader and more high level paradigm shifts such as Smart Cities, Smart Health, Industry 4.0 and Circular Economies. The particular characteristics of IoT systems and networks (massive numbers of connections, highly constrained low-end devices, interactions and feedback loops between the digital and physical space, Machine-to-Machine communication, etc) ask for highly-skilled professionals with a focused expertise on IoT that are currently (as of 2018) scarcely available in the market.

MSc Internet of Things is intended for candidates that already have a solid background in Computer Science, Computer Engineering or a relevant field, who wish to become IoT expert professionals. The programme assumes a multi-faceted approach combining theoretical foundations of IoT and ad-hoc networks, hands-on experience with real-life IoT systems and technologies, and an all-around understanding of how IoT is positioned in the context of broader paradigms by integrating managerial and business aspects. The latter is achieved by incorporating corresponding material in the curriculum, by informing (and if possible engaging) students in relevant standardisation activities in which BU is involved (such as in International Telecommunications Union) and by hosting guest lecturers from local and national industry. Finally, the programme equips students with methodological thinking, research disposition and communication skills.

This programme aims to develop critically informed, agile and resourceful graduates, who:

- have a clear and multi-faceted understanding of the IoT paradigm;
- have a deep understanding of the technical aspects of IoT systems and networks;
- have a critical understanding of the latest advances in the field of IoT in terms of research and industry;
- can demonstrate research skills in areas such as literature reviews, critical analysis of research findings, project proposals, planning, experiment design and analysis, and dissemination.

ALIGNMENT WITH THE UNIVERSITY'S STRATEGIC PLAN

The MSc Internet of Things programme is informed by, well aligned with, and contributes to BU 2025 strategic plan and the University's fusion agenda. It also serves the core BU 2025 values of Excellence, Inclusivity, Creativity and Responsibility. In particular, students are supported by academics that are active and esteemed by the international research community. Involved academics are also very active in international standardisation activities (such as in ITU and ETSI) and have strong synergy liaisons with local, national and international industry. The programme's innovative pedagogic approach offers students the opportunity to learn via hands-on experience with real IoT hardware and commercially available technologies; via collaborative learning; and by engaging with the industry via guest lectures. As a result, students are equipped with the full range of skills (both "hard"-technical and "soft"-transferable ones) needed in order to successfully pioneer in the IoT domain. It is worth noting that Internet of Things is a key enabling technology for future and emerging network and system paradigms (such as 5G networks, Machine Intelligence, the Future Internet, etc) and therefore is directly related to the Strategic Investment Areas of BU in a horizontal and overarching manner and in particular to "*Sustainability & Low Carbon Technology*" and to "*Assistive Technology*".

LEARNING HOURS AND ASSESSMENT

Bournemouth University taught programmes are composed of units of study, which are assigned a credit value indicating the amount of learning undertaken. The minimum credit value of a unit is normally 20 credits, above which credit values normally increase at 20-point intervals. 20 credits is the equivalent of 200 study hours required of the student, including lectures, seminars, assessment and independent study. 20 University credits are equivalent to 10 European Credit Transfer System (ECTS) credits.

The assessment workload for a unit should consider the total time devoted to study, including the assessment workload (i.e. formative and summative assessment) and the taught elements and independent study workload (i.e. lectures, seminars, preparatory work, practical activities, reading, critical reflection).

Assessment per 20 credit unit should normally consist of 3,000 words or equivalent. Dissertations and Level 6 and 7 Final Projects are distinct from other assessment types. The word count for these assignments is 5,000 words per 20 credits, recognising that undertaking an in-depth piece of original research as the capstone to a degree is pedagogically sound.

STAFF DELIVERING THE PROGRAMME

Students will usually be taught by a combination of senior academic staff with others who have relevant expertise including – where appropriate according to the content of the unit – academic staff, qualified professional practitioners, demonstrators/technicians and research students.

PROGRAMME AND LEVEL 7 INTENDED PROGRAMME OUTCOMES

<table>
<tr><td>A: Subject knowledge and understanding

This programme provides opportunities for students to develop and demonstrate knowledge and understanding of:</td><td>The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme/level learning outcomes:</td></tr>
<tr><td rowspan="2">A1 Principles and techniques of IoT-based research.

A2 Enabling technologies for IoT applications.

A3 A rigorous engineering approach to investigating and solving IoT problems in diverse contexts.

A4 The management and development of IT solutions to address IoT or other problems.

A5 The professional, legal, and ethical responsibilities of IoT engineers and scientists within the organisational, technical and global contexts in which IoT is applied.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (A1 – A5);
• seminars (A1 – A5);
• lab sessions (A1 – A5);
• directed reading (A1 – A5);
• independent research (for dissertation) (A1 – A5).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• coursework essays (A1 – A5);
• dissertation (A1 – A5).</td></tr>
<tr><td>B: Intellectual skills

This programme provides opportunities for students to:</td><td>The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme outcomes:</td></tr>
<tr><td>B1 Critical thinking, problem-solving and decision-making to solve complex IoT problems.

B2 Analyse, interpret, synthesis, and critically evaluate information from current research.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (B1- B5);
• seminars (B1 – B5);</td></tr>
</table>

B3 Critically evaluate and justify alternative approaches to solutions development; **B4** Formulate, plan, execute, and report on a IoT project involving original contributions. **B5** Communicate findings to professional and academic standards;	• workshops (B1 – B5); • directed reading (B4 – B5); • use of the VLE (B4 – B5); • independent research (for project) (B1 – B5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (B1 – B5); • dissertation (B1 – B5).
C: Practical skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme/level learning outcomes:
C1 Retrieve, select, and evaluate information from a variety of sources; **C2** Analyse, specify, design and implement IoT applications to meet business goals. **C3** Select appropriate methods and tools for solving IoT problems; **C4** Plan, monitor and evaluate the progress of an IoT solution.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (C1 – C4); • coursework essays (C1 – C4); • independent research for empirical dissertation (C1 – C4); • group exercises (C1 – C4). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (C1 – C4); • dissertation (C1 – C4).
D: Transferable skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:
D1 Demonstrate problem solving skills and the application of knowledge across the discipline areas. **D2** Gather, select, and analyse a range of experimental and/or fieldwork data and present professionally using appropriate media. **D3** Structure and communicate ideas professionally and effectively to appropriate professional and academic standards. **D4** Demonstrate initiative, self-direction and exercise personal responsibility for management of own learning. **D5** Distil, synthesise and critically analyse alternative approaches and methodologies to problems and research results reported in literature and elsewhere.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (D1 – D5); • seminars (D1 – D5); • workshops (D1 – D5); • directed reading (D2 – D5); • use of the VLE (D2 – D5); • independent research (for project) (D1 – D5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (D1 – D5); • dissertation (D1- D5).

LEVEL 7/PG Dip INTENDED LEVEL OUTCOMES

A: Subject knowledge and understanding This programme provides opportunities for students to develop and demonstrate knowledge and understanding of*:*	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme/level learning outcomes:
A1 Principles and techniques of IoT-based research. **A2** Enabling technologies for IoT applications. **A4** The management and development of IT solutions to address IoT or other problems. **A5** The professional, legal, and ethical responsibilities of IoT engineers and scientists within the organisational, technical and global contexts in which IoT is applied.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (A1 – A5); • seminars (A1 – A5); • lab sessions (A1 – A5); • directed reading (A1 – A5); Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (A1 – A5);
B: Intellectual skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme outcomes:
B1 Critical thinking, problem-solving and decision-making to solve complex IoT problems. **B2** Analyse, interpret, synthesis, and critically evaluate information from current research. **B3** Critically evaluate and justify alternative approaches to solutions development; **B5** Communicate findings to professional and academic standards;	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (B1- B5); • seminars (B1 – B5); • workshops (B1 – B5); • directed reading (B4 – B5); • use of the VLE (B4 – B5); Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (B1 – B5);
C: Practical skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme/level learning outcomes:
C1 Retrieve, select, and evaluate information from a variety of sources; **C3** Select appropriate methods and tools for solving IoT problems; **C4** Plan, monitor and evaluate the progress of an IoT	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (C1 – C4); • coursework essays (C1 – C4); • group exercises (C1 – C4).

solution.	Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (C1 – C4).
D: Transferable skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:
D1 Demonstrate problem solving skills and the application of knowledge across the discipline areas. **D2** Gather, select, and analyse a range of experimental and/or fieldwork data and present professionally using appropriate media. **D3** Structure and communicate ideas professionally and effectively to appropriate professional and academic standards. **D4** Demonstrate initiative, self-direction and exercise personal responsibility for management of own learning.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (D1 – D4); • seminars (D1 – D4); • workshops (D1 – D4); • directed reading (D2 – D4); • use of the VLE (D2 – D4);
	Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (D1 – D4).

LEVEL 7/PG Cert INTENDED LEVEL OUTCOMES

A: Subject knowledge and understanding This programme provides opportunities for students to develop and demonstrate knowledge and understanding of*:*	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme/level learning outcomes:
A1 Principles and techniques of IoT-based research. **A4** The management and development of IT solutions to address IoT or other problems. **A5** The professional, legal, and ethical responsibilities of IoT engineers and scientists within the organisational, technical and global contexts in which IoT is applied.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (A1 – A5); • directed reading (A1 – A5);
	Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (A1 – A5);
B: Intellectual skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme outcomes:
B1 Critical thinking, problem-solving and decision-making to solve complex IoT problems.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (B1- B5);

B2 Analyse, interpret, synthesis, and critically evaluate information from current research. **B5** Communicate findings to professional and academic standards;	• directed reading (B2 – B5); • use of the VLE (B5); Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (B1 – B5)
C: Practical skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme/level learning outcomes:
C1 Retrieve, select, and evaluate information from a variety of sources; **C4** Plan, monitor and evaluate the progress of an IoT solution.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (C1 – C4); • coursework essays (C1 – C4). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (C1 – C4);
D: Transferable skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:
D2 Gather, select, and analyse a range of experimental and/or fieldwork data and present professionally using appropriate media. **D3** Structure and communicate ideas professionally and effectively to appropriate professional and academic standards. **D4** Demonstrate initiative, self-direction and exercise personal responsibility for management of own learning.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (D2 – D4); • directed reading (D2 – D4); • use of the VLE (D2 – D4); Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework essays (D2 – D4);

ADMISSION REGULATIONS

The regulations for this programme are the University's Standard Postgraduate/ Graduate Diploma/ Graduate Certificate Admission Regulations with the following exceptions: Applicants whose mother tongue is not English must offer evidence of qualifications in written and spoken English. Acceptable qualifications are:
IELTS (academic) 6.0 (with a minimum of 5.5 in each of four categories) or direct equivalent.

https://intranetsp.bournemouth.ac.uk/pandptest/3a-postgraduate-admissions-regulations.pdf

The programme is specifically targeting to recruit students who have either recently graduated, wish to extend their knowledge to Masters level, or would like to prepare themselves to undertake PhD

research. When considering applicants, their academic profile and relevant experience, as well as their commitment to study are normally considered.

MSc Internet of Things is for students who have graduated from a computing-related or STEM degree and want to increase their knowledge and skills before starting work, or have significant experience working in the industry in a closely related field. It addresses the work force skills-gap that is currently present (as of 2018) in the market in the areas of IoT, cyber-physical systems, smart cities/buildings/homes, etc.

PROGRESSION ROUTES

Recognition arrangements provide formally approved entry or progression routes through which students are eligible to apply for a place on a programme leading to a BU award. Recognition does not guarantee entry onto the BU receiving programme only eligibility to apply. In some cases, additional entry criteria such as a Merit classification from the feeder programme may also apply. Please see the Recognition Register (https://intranetsp.bournemouth.ac.uk/pandptest/7J_Recognition_Register_Public.xlsx) for a full list of approved Recognition arrangements and agreed entry criteria.

In order to take advantage of exciting new approaches to learning and teaching, as well as developments in industry, the current, approved Articulation/Recognition/Progression route(s) for this programme may be subject to change. Where this happens students will be informed and supported by the Faculty as early as possible.

ASSESSMENT REGULATIONS

The regulations for this programme are the University's Standard Postgraduate / Graduate Diploma / Graduate Certificate Assessment Regulations. In particular,
For MSc Internet of Things:
https://intranetsp.bournemouth.ac.uk/pandptest/6a-standard-assessment-regulations-postgraduate.pdf

For PGDip Internet of Things and PGCert Computing:
https://intranetsp.bournemouth.ac.uk/pandptest/6a-standard-assessment-regulations-gradcert-graddip.pdf

WORK BASED LEARNING (WBL) AND PLACEMENT ELEMENTS

Students, under the guidance of lecturers and the Placement Office, are able to opt in for a minimum 30-weeks placement before Dissertation. The placement is assessed on a pass/fail basis using the log book and employer appraisal. The 30 week placement must be completed after completing all taught units.

Refer to *4K – Placements: Policy and Procedure* for more details.

Programme Skills Matrix

Units		Programme Intended Learning Outcomes																		
		A 1	**A 2**	**A 3**	**A 4**	**A 5**	**B 1**	**B 2**	**B 3**	**B 4**	**B 5**	**C 1**	**C 2**	**C 3**	**C 4**	**D 1**	**D 2**	**D 3**	**D 4**	**D 5**
STAGE 1 /L7	**Wireless Sensor & Actuator Networks**	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Mobile and Wireless Networks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Research Methods & Professional Issues					X		X	X	X	X			X	X	X	X	X	X	X
	Security and Privacy in IoT	X	X		X		X	X	X	X		X	X	X		X		X	X	X
	Cloud Computing		X			X			X	X	X			X	X	X	X	X	X	X
	Blockchain and Digital Futures	X	X	X	X		X	X	X	X		X	X	X		X		X	X	X
	Human Centred Design			X	X	X	X	X	X		X	X	X	X		X	X	X	X	X
	Smart Systems		X	X					X	X	X			X	X	X	X	X	X	X
STG2 / L7	**Individual Masters Project**	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

A – Subject Knowledge and Understanding
This programme provides opportunities for students to develop and demonstrate knowledge and understanding of:

A1 Principles and techniques of IoT-based research.
A2 Enabling technologies for IoT applications.
A3 A rigorous engineering approach to investigating and solving IoT problems in diverse contexts.
A4 The management and development of IT solutions to address IoT or other problems.
A5 The professional, legal, and ethical responsibilities of IoT engineers and scientists within the organisational, technical and global contexts in which IoT is applied.

B – Intellectual Skills
This programme provides opportunities for students to:

B1 Critical thinking, problem-solving and decision-making to solve complex IoT problems.
B2 Analyse, interpret, synthesis, and critically evaluate information from current research.
B3 Critically evaluate and justify alternative approaches to solutions development;
B4 Formulate, plan, execute, and report on a IoT project involving original contributions.
B5 Communicate findings to professional and academic standards;

C – Subject-specific/Practical Skills
This programme provides opportunities for students to:

C1 Retrieve, select, and evaluate information from a variety of sources;
C2 Analyse, specify, design and implement IoT applications to meet business goals.
C3 Select appropriate methods and tools for solving IoT problems;
C4 Plan, monitor and evaluate the progress of an IoT solution.

D – Transferable Skills
This programme provides opportunities for students to:
D1 Demonstrate problem solving skills and the application of knowledge across the discipline areas.
D2 Gather, select, and analyse a range of experimental and/or fieldwork data and present professionally using appropriate media.
D3 Structure and communicate ideas professionally and effectively to appropriate professional and academic standards
D4 Demonstrate initiative, self-direction and exercise personal responsibility for management of own learning.
D5 Distil, synthesise and critically analyse alternative approaches and methodologies to problems and research results reported in literature and elsewhere.