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 Robotics - 180 Credits (90 ECTS)	
Intermediate award(s), title(s) and credits PGDip Robotics - 120 Credits (60 ECTS) PGCert Robotics - 60 Credits (30 ECTS)	
UCAS Programme Code(s) (where applicable and if known) N/A	**HECoS codes** 100170 - Mechatronics and Robotics (major) 100192 - Electromechanical Engineering (minor) 100163 - Electrical and Electronic Engineering (minor)
External reference points • www.cphc.ac.uk/docs/cphc_masters_april_final.pdf http://www.qaa.ac.uk/academicinfrastructure/fheq/EWNI/default.asp QAA Chapter A1: The national level (incorporating the Framework for Higher Education Qualifications (FHEQ) in England, Wales and Northern Ireland) QAA Chapter A2: The Subject and Qualification Level (incorporating Masters Degree Characteristics)	
Professional, Statutory and Regulatory Body (PSRB) links N/A	
Places of delivery Bournemouth University, Talbot Campus	
Mode(s) of delivery Full-time (FT); Part-time (PT)	**Language of delivery** English
Typical duration Sept FT = 12 months Sept PT = 24 months Jan FT = 16 months, Jan PT = 32 months,	
Date of first intake September 2023	**Expected start dates** September, January
Maximum student numbers N/A	**Placements** N/A
Partner(s) Not applicable	**Partnership model** Not applicable
Date of this Programme Specification February 2023	
Version number 1.0-0924	
Approval, review or modification reference numbers E222312 EC 2223 47	
Author Dr. Roya Haratian	

PROGRAMME STRUCTURE

Programme Award and Title: MSc Robotics								
Stage 1/Level 7 Students are required to complete 7 core units								
Unit Name	**Core/ Option**	**No. of Credits**	**Assessment Element Weightings**			**Expected Contact hours per unit**	**Unit Version No.**	**HECoS Code** (plus balanced or major/minor load)
			Exam 1	**Cwk 1**	**Cwk 2**			
Robotic System	Core	20		100%		30	1.0	100170 (major) 100192 (minor)
Robotic Control Design	Core	20		100%		30	1.0	100170 (major), 100163 (minor)
Research Methods	Core	20		100%		30	2.1	100962 (major), 101090 (minor)
Computer Vision	Core	20		100%		30	1.0	100968 (major) 100170 (minor),
Applied Programming for Data Science	Core	20		100%		30	1.0	100359 (major), 100170 (minor),
Knowledge Transfer	Core	20		100%		30	2.1	100810 (major), 100812 (minor)
Individual Engineering Masters Project	Core	60		90%	10%	7.5	2.1	100170 (Major), 100192 (Minor)
Progression requirements: There are no progression requirements. **Exit qualification:** PG Dip Robotics requires 120 credits at Level 7 (excluding 60 credit Individual Masters Project). PG Cert Robotics requires 60 credits at Level 7.								

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

MSc Robotics course would provide a comprehensive understanding of multidisciplinary Robotic systems as an integration of mechanical systems, electronics and intelligent computer-based control. It will provide background for a wide range of technology careers that require knowledge and skills to be specialised in Mechatronic Robotics involving technologies in design, construction, operation and application of robots.

Utilising existing resources at BU, including the Design & Engineering Innovation Centre, multidisciplinary units and staff from BU's Design and Engineering as well as Computing and Informatics departments are the motives for development of a multidisciplinary MSc programme as integration of Mechanical Engineering, Electronics and Intelligent Computer Control.

It is suitable for engineering, mathematics or physical sciences graduates who wish to specialise in multidisciplinary Robotics engineering science or to support continued professional development. It

offers a comprehensive understanding of the relevant fundamental science, methods, analysis and engineering applications.

The primary aim of this programme is the development of Masters level graduates who have

- a critical understanding of Robotics and Mechatronics required in design, construction, operation and application of Robots Mechatronics Systems
- a critical understanding in latest advances in Robotics and Mechatronic systems
- technical skills and competencies to work across different engineering disciplines in integration of mechanical engineering, electronics, computer-based control systems.
- 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 Robotics programme is informed by and well aligned with Bournemouth University's strategic plan and the fusion of excellent teaching, world-class research and professional practice that is at the heart of the institution's visions and values. Students are supported by academics with a wealth of industry experience, many of whom are actively engaged in various robotics and mechatronics projects with several external organisations. Academics delivering the programme are actively engaged in cutting edge research, while students are encouraged to participate in a range of co-creation and co-publication projects. The programme's pedagogic approach offers students the opportunity to learn by engaging in a series of practical, industry focused tasks. These are aimed at equipping students with the full range of skills necessary to succeed in the contemporary robotics and mechatronics field informed by the academic team's own industrial experience as well as industry contacts, who may also contribute directly to the programme by delivering guest lectures. "Therefore, the programme is aligned with 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, recognizing that undertaking an in-depth piece of original research as the capstone to a degree is pedagogically sound.
Students have the opportunity to undertake the industrial placement at a minimum of 30 weeks of full-time work-based learning between Stage 1 and Stage 2.

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

A: Knowledge and understanding This programme/level 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 level learning outcomes:
A1 Principles and techniques of robotics and mechatronics - based research. **A2** Enabling technologies for robotics and mechatronics applications. **A3** A rigorous engineering approach to investigating and solving robotics and mechatronics problems in diverse contexts. **A4** The management and development of robotics and mechatronics solutions to address robotics and mechatronics or other problems. **A5** The professional, legal, and ethical responsibilities of robotics and mechatronics engineers and scientists within the organizational technical and global contexts in which robotics and mechatronics is applied.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (A1- A5); • seminars (A1 – A5); • workshops/laboratories (A1 – A5); • directed reading (A1 – A5); • use of VLE (A1 – A5); • independent research (for project) (A1 – A5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • examinations (A1 – A5); • coursework (A1 – A5); • project (A1 – A5).
B: Intellectual skills This programme/level provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the level learning outcomes:
B1 Critical thinking, problem-solving and decision-making to solve complex robotics and mechatronics 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 robotics and mechatronics project involving original contributions. **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/laboratories (B1 – B5); • use of VLE (B1 – B5); • independent research (for project) (B1 – B5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • examinations (B1 – B5); • coursework (B1 – B5); • project (B1 – B5).
C: Practical skills This programme/level provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the level learning outcomes:
C1 Retrieve, select, and evaluate information from a variety of sources; **C2** Analyse, specify, design and implement robotics and mechatronics applications to meet business goals. **C3** Select appropriate methods and tools for solving robotics and mechatronics problems;	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (C1 – C4); • seminars, laboratories and workshops (C1 – C4); • VLE (C1 – C4); • independent research (for project) (C1 – C5).

C4 Plan, monitor and evaluate the progress of robotics and mechatronics solution.	Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • examinations (C1 – C4); • coursework (C1 – C4); • project (C1 – C4).

D: Transferable skills This programme/level provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the level 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 VLE (D1 – D5); • independent research (for project) (D1 – D5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • examinations (D1 – D5); • coursework (D1 – D5); • project (D1 – D5).

ADMISSION REGULATIONS

Please refer to the BU website for further information regarding admission regulations for this programme: www.bournemouth.ac.uk/courses

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 RecognitionRegister (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 Assessment Regulations.

WORK BASED LEARNING (WBL) AND PLACEMENT ELEMENTS

N/A

MSc Robotics Programme Skills Matrix

Stage	Unit	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**
1	Robotic System (D&E)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1	Robotics Control Design (D&E)		X	X		X	X	X	X	X		X		X	X	X	X	X	X	X
1	Research Methods						X	X			X			X	X	X	X	X	X	X
1	Computer Vision (C&I)	X		X		X	X	X	X	X		X		X	X	X	X	X	X	X
1	Applied Programming for Data Science	X	X	X	X	X	X	X	X	X		X	X		X	X	X		X	X
1	Knowledge Transfer (D&E)	X		X	X	X	X	X			X		X	X	X	X		X	X	X
2	Individual Engineering 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 robotics and mechatronics -based research.
A2 Enabling technologies for robotics and mechatronics applications.
A3 A rigorous engineering approach to investigating and solving robotics and mechatronics problems in diverse contexts.
A4 The management and development of robotics and mechatronics solutions to address robotics and mechatronics or other problems.
A5 The professional, legal, and ethical responsibilities of robotics and mechatronics engineers and scientists within the organizational technical and global contexts in which robotics and mechatronics is applied.

B – Intellectual Skills

This programme provides opportunities for students to:

B1 Critical thinking, problem-solving and decision-making to solve complex robotics and mechatronics 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 robotics and mechatronics project involving original contributions.
B5 Communicate findings to professional and academic standards.

C – Subject Specific 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 robotics and mechatronics applications to meet business goals.
C3 Select appropriate methods and tools for solving robotics and mechatronics problems;
C4 Plan, monitor and evaluate the progress of robotics and mechatronics 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.