

# Undergraduate Programme Specification

## BSc (Hons) AI and Data Science

This specification provides a summary of the main features of the programme and learning outcomes that a student might reasonably be expected to achieve and demonstrate where full advantage is taken of all learning opportunities offered. Further details on the learning, teaching and assessment approach for the programme and modules can be accessed on the University website and Virtual Learning Environment, GCU Learn. All programmes of the University are subject to the University's [Quality Assurance](#) processes.

GENERAL INFORMATION			
<b>Programme Title</b>	BSc (Hons) AI and Data Science		
<b>Final Award</b>	BSc (Hons) AI and Data Science BSc (Hons) AI and Data Science (Sandwich)		
<b>Awarding Body</b>	Glasgow Caledonian University		
<b>School</b>	School of Computing, Engineering and Built Environment		
<b>Department</b>	Computing		
<b>Mode of Study</b>	Full-time		
<b>Location of Delivery</b>	Glasgow Campus		
<b>UCAS Code</b>			
<b>Accreditations (PSRB)</b>			
<b>Period of Approval</b>	From:	September 2023	To: August 2028

EDUCATIONAL AIMS OF PROGRAMME
<p><b>GENERAL INTRODUCTION</b></p> <p>The BSc/BSc (Hons) AI and Data Science programme has been developed to provide students with the knowledge, understanding and skills needed to become effective Data Science professionals capable of working on the development of the software, data analysis and AI systems required by modern industry.</p> <p>The programme provides a specialised route for students who wish to become technical experts in the field of AI and Data Science. The programme offers a 2 + 2 pathway.</p> <p>The broad educational aims of the programme are to:</p> <ul style="list-style-type: none"> <li>• Provide students with the necessary specialist computing knowledge and skills to equip them for a career in the development and support of computer-based information systems with a focus on AI and Data Science.</li> <li>• Provide students with a specific understanding of the concepts, processes, methods and tools, and their application, to their selected specialist area</li> <li>• Enable students to develop a cultural understanding of computing applications and the computing and data science industry</li> <li>• Develop the ability to apply sound design principles and practical skills</li> <li>• Enable students to acquire good analytical, synthetic and communication skills</li> </ul>

- Enable students to take responsibility for their own learning as they progress through the programme.
- Assist the student in developing the skills required in adapting to changing technological and organisational developments and learning new skills
- Provide articulation opportunities to access the programme for students with appropriate prior accredited learning experiences
- Provide education and training which is accredited by the British Computer Society

### **Expected Levels of Attainment**

- On successful completion of year 1 a student should have a basic knowledge of the software and hardware concepts which underpin modern computing systems.
- On successful completion of year 2 a student should have a sound knowledge of software design and development and show competence in applying this to a range of software development domains.
- On successful completion of year 3 a student should be able to plan, specify, design, implement and support components of a software system in response to a business need in accordance with fundamental principles and methods, using appropriate techniques and tools.
- On successful completion of year 4 (honours) a student will, in addition, be able to critically evaluate alternative approaches to software solutions and be able to use advanced knowledge and techniques in the construction of a software solution.

### **LEARNING OUTCOMES**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

#### **A: Knowledge and understanding;**

- A1 Explain the theoretical and practical aspects of software and hardware which underpin modern computer systems
- A2 Demonstrate knowledge and understanding of facts, concepts, principles and theories relating to the development of software solutions for a range of contemporary computer systems utilising current AI and Data Science techniques
- A3 Utilize and appraise tools and techniques to assist in the development of software solutions for a range of contemporary computer systems
- A4 Demonstrate an understanding of the methods used to specify, model, develop, deploy and maintain software systems in an operational context
- A5 Demonstrate an awareness of the role of the IT professional and the context in which they operate including moral, legal, safety and ethical issues
- A6 Demonstrate an understanding and appreciation of the importance of negotiation, effective work habits, leadership and good communication with stakeholders
- A7 Demonstrate an understanding of a range of technologies and the techniques required in the development of software systems.

#### **B: Practice: Applied knowledge, skills and understanding;**

- B1 Identify, analyse and solve practical problems across a variety of application domains
- B2 Evaluate alternative solutions to problems in an appropriate subject domain.
- B3 Demonstrate effective use of a variety of appropriate techniques, tools and integrated development environments in the development and deployment of computer based information systems
- B4 Use appropriate methods and techniques to specify, develop and deploy IT systems and services

B5 Demonstrate competence in using processes to manage IT projects within an operational context

B6 Apply theory to practical and realistic career-related tasks

**C: Generic cognitive skills;**

C1 Plan, conduct and report upon work

C2 Critical thinking and problem solving

C3 Critical analysis

C4 Self-confidence, self-discipline & self-reliance (independent working)

C5 Creativity, innovation & independent thinking

C6 Gather and evaluate research information from a variety of sources

**D: Communication, numeracy and ICT skills**

D1 Communication skills, written, oral and listening

D2 Numeracy

D3 Effective information retrieval and research skills

D4 Computer literacy

D5 Presentation skills

**E: Autonomy, accountability and working with others.**

E1 Awareness of strengths and weaknesses/ Planning, monitoring, reviewing and evaluating own learning and development

E2 Reliability, integrity, honesty and ethical awareness

E3 Ability to prioritise tasks and time management

E4 Appreciating and desiring the need for continuing professional development

E5 Interpersonal skills, team working and leadership

E6 Entrepreneurial independence and risk-taking

E7 Knowledge of international affairs

E8 Commercial Awareness

**F: Additional Industrial Placement Skills**

The programme has an optional one-year credit-rated placement period in related employment which provides the opportunity for further development of the taught practical, personal and professional skills in a work-based environment

F1 Gain additional competence and training in the application of the practical skills of the programme.

F2 Develop an understanding of the practical considerations that constrain the application of theory in the workplace.

F3 Communicate and interact effectively within a work-based situation

F4 Evaluate current research and technology concepts and their relationship and application to a work-based problem

## LEARNING AND TEACHING METHODS

The programme provides a variety of learning and teaching methods. Programme and Module specific guidance will provide detail of the learning and teaching methods specific to each module.

Across the programme the learning and teaching methods and approaches may include the following:

- Lectures
- Seminars
- Practical classes
- Placements
- Simulation experiences
- Groupwork
- Flipped classroom approaches
- Online learning

The above approaches may be delivered either in person or online as appropriate and determined at module level by the Module Leader.

## ASSESSMENT METHODS

The programme provides a variety of formative and summative assessment methods. Programme and Module specific guidance will provide detail of the assessment methods specific to each module.

Across the programme the assessment methods may include the following:

- Written coursework (essays, reports, case studies, dissertation, literature review)
- Oral coursework (presentations, structured conversations)
- Practical Assessment (Placement, VIVA, Laboratory work)
- Group work
- Blogs and Wikis
- Portfolio Presentations
- Formal Examinations and Class Tests

The above assessments may be delivered either in person and online as appropriate and determined at module level by the Module Leader.

## ENTRY REQUIREMENTS

Specific entry requirements for this programme can be found on the prospectus and study pages on the GCU website at this location: [www.gcu.ac.uk/study](http://www.gcu.ac.uk/study)

All students entering the programme are required to adhere to the [GCU Code of Student Conduct](#).

## PROGRAMME STRUCTURE AND AVAILABLE AND FINAL EXIT AWARDS<sup>1</sup>

The following modules are delivered as part of this programme:

Module Code	Module Title	Core or Optional	SCQF Level	Credit Size	Coursework %	Examination %	Practical %
M1I325623	Fundamentals of Computer Systems	Core	7	10	100%		
M1I326709	Fundamentals of Software Engineering	Core	7	20	100%		
M1I326719	Programming 0	Core	7	20	100%		
M1I325851	Maths for Computing	Core	7	20	40%	60%	
M1I325624	Fundamentals of Network and Cloud Computing	Core	7	10	100%		
M1I325625	Database Development	Core	7	20	100%		
M1I326724	Practical Computing	Core	7	20	100%		
M2I326721	Programming 1	Core	8	20	100%		
M2I322952	Object Oriented Analysis & Design	Core	8	20	100%		
M2I625666	Human Computer Interaction	Core	8	20	100%		
M2I326729	Programming 2	Core	8	20	100%		
M2I326713	Web Application Development 1	Core	8	20	100%		
M2I226701	Software Processes and Practices	Core	8	20	100%		
M3I325687	DevOps	Core	9	20	100%		
M3W226703	Group Project	Core	9	20	100%		
M3I326697	Introduction to Data Science	Core	9	20	100%		
M3I326184	Research Skills & Professional Issues	Core	9	20	100%		
M3I326696	Programming 3 (DS & A/AP)	Core	9	20	100%		
M3I326700	Data Visualisation	Core	9	20	100%		
MHW225671	Honours Project	Core	10	40	100%		
MHI226694	Big Data and IoT	Core	10	20	100%		
MHI226699	Advanced Data Science	Core	10	20	100%		
MHI326725	Cloud Platform Development	Core	10	20	50%	50%	
MHI226720	Machine Learning	Core	10	20	100%		

<sup>1</sup> Periodically, programmes and modules may be subject to change or cancellation. Further information on this can be found on the GCU website here: [www.gcu.ac.uk/currentstudents/essentials/policiesandprocedures/changesandcancellationtoprogrammes](http://www.gcu.ac.uk/currentstudents/essentials/policiesandprocedures/changesandcancellationtoprogrammes)

Students undertaking the programme on a full-time basis commencing in September of each year will undertake the modules in the order presented above. This may be subject to variation for students commencing the programme at other times of year (e.g. January) and/or undertaking the programme on a part-time or distance learning mode of delivery.

The following final and early Exit Awards are available from this programme<sup>2</sup>:

**Certificate of Higher Education in AI and Data Science** - *achieved upon successful completion of 120 credits*

**Diploma of Higher Education in AI and Data Science** - *achieved upon successful completion of 240 credits*

**Bachelor of Science in AI and Data Science** - *achieved upon successful completion of 360 credits*

**Bachelor of Science with Honours in AI and Data Science** - *achieved upon successful completion of 480 credits*

***Industrial Placement Year (Optional) Exit Award***

Students opting to undertake placement do so in the academic session after level 3 studies. Assessment is via the additional 60 SCQF credit level 9 module, M31323077 Industrial Placement. Successful completion of that module gives (Sandwich) in the final exit award obtained by the student. Students to follow the 2+2 pathway also have this option.

## **ASSESSMENT REGULATIONS**

Students should expect to complete their programme of study under the GCU Assessment Regulations that were in place at the commencement of their studies on that programme, unless proposed changes to University Regulations are advantageous to students. These can be found at:

[www.gcu.ac.uk/aboutgcu/supportservices/qualityassuranceandenhancement/regulationsandpolicies](http://www.gcu.ac.uk/aboutgcu/supportservices/qualityassuranceandenhancement/regulationsandpolicies)

In addition to the GCU Assessment Regulations noted above, this programme is subject to Programme Specific Regulations in line with the following approved Exceptions:

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<sup>2</sup> Please refer to the [GCU Qualifications Framework](#) for the minimum credits required for each level of award and the Programme Handbook for requirements on any specified or prohibited module combinations for each award.

Case No: **215**

Details:

**Exception to Assessment Regulations, Sub-section 13.2.1 Compensation:** *Compensation is to make provision for allowing, within specific limits, the overall performance of a student to compensate for failure in up to and including 30 credit points of module(s) during the course of the programme, excluding Level 7.*

Case No: **216**

Details:

**Exception to Undergraduate Assessment Regulations, Sub-sections 19.4; 19.7.1; 19.8.2 Classification of Honours Award:** *that the Level 3 Industrial Placement module is excluded from the Honours Classification Calculation Set.*

**VERSION CONTROL (to be completed in line with AQPP processes)**

**Any changes to the PSP must be recorded below by the programme team to ensure accuracy of the programme of study being offered.**

<i>Version Number</i>	<i>Changes/Updates</i>	<i>Date Changes/Updates made</i>	<i>Date Effective From</i>
1.0			