

Programme Specification

Programme Summary Information				
1	Programme Title		CertHE in Computer Science with Artificial Intelligence BSc (Hons) Computer Science with Artificial Intelligence	
2	University of Sunderland Course Code		UCAS Code	
3	Awarding Institution		University of Sunderland	
4	Teaching Institution(s) (if different from point 3)		University of Sunderland in London	
5	Professional Statutory or Regulatory Body (PSRB) (if applicable)		N/A	
6	For Apprenticeships:			
	Name of Apprenticeship Standard		N/A	
	Apprenticeship Standard Number		N/A	
	Skills England LARS Number		N/A	
7	Programme Description			
	Overview The CertHE in Computer Science with Artificial Intelligence and BSc (Hons) Computer Science with Artificial Intelligence programmes are designed to develop graduates with a strong foundation in core computing alongside advanced expertise in artificial intelligence. The curriculum is structured to ensure a clear progression from fundamental principles to specialised, industry-relevant applications, enabling students to build both technical depth and professional competence. At level 4, the programmes focus on establishing essential knowledge and skills in programming, mathematics, algorithms and computer systems, while introducing the core concepts of artificial intelligence and data. Students develop computational thinking and learn how to design, implement and test simple software solutions. At this stage, teaching is highly structured and supported, allowing students to gain confidence and familiarity with key tools, techniques and ways of thinking that underpin the discipline. At level 5, the BSc Computer Science with Artificial Intelligence emphasises the application and integration of knowledge. Students engage more deeply with machine learning, software design and database systems, while also studying advanced algorithms and optimisation techniques. The curriculum introduces ethical, legal and societal considerations through a dedicated focus on responsible artificial intelligence and human-centred computing. Learning becomes more applied and collaborative, with students working on real-world datasets and developing systems that reflect contemporary industry practices. At level 6, the BSc Computer Science with Artificial Intelligence advances to specialist topics such as deep learning, natural language processing and AI systems engineering. Students			

develop the ability to design, optimise and deploy intelligent systems in scalable and realistic environments, including cloud-based platforms. A key feature of the programme is the Capstone Artificial Intelligence Innovation Project, which replaces the traditional dissertation. This project requires students to independently identify a complex problem, design and implement an AI-based solution and evaluate its effectiveness while considering ethical and sustainability implications. It provides an opportunity to synthesise learning from across the programme and demonstrate readiness for professional practice.

The programmes combine theoretical understanding with practical application through lectures, laboratory work, collaborative projects and independent study. Assessment is designed to reflect real-world tasks, focusing on the development of technical artefacts, analytical skills and professional communication. Graduates leave with a strong portfolio of work, experience with modern tools and frameworks and an understanding of the broader impact of artificial intelligence, preparing them for careers in computing and AI or for further study.

What's covered in the course?

The CerTHE in Computer Science with Artificial Intelligence and in the early stages of the BSc (Hons) Computer Science with Artificial Intelligence, students are introduced to the fundamental concepts of computer science. This includes programming, where they learn how to design and develop software using structured approaches, and computational thinking, which underpins problem-solving in computing. Alongside this, students study mathematics for computing, including linear algebra, probability and discrete mathematics, which form the basis for algorithm design and machine learning. Core topics such as data structures, algorithms, and computer systems provide an understanding of how software operates efficiently and how hardware and operating systems support computation.

As the BSc (Hons) Computer Science with Artificial Intelligence progresses, students engage with more advanced and applied areas of computing. Software engineering is explored in depth, including object-oriented design, system architecture and the full software development lifecycle. Database systems are studied to enable effective storage, retrieval and management of data, while algorithmic complexity and optimisation techniques are examined to ensure efficient system design. At this stage, students also begin to work with real datasets and develop a deeper understanding of how computational solutions are applied in practice.

Artificial intelligence is a central theme throughout the BSc (Hons) Computer Science with Artificial Intelligence. Students explore the principles of machine learning, including supervised and unsupervised approaches, and learn how to train, evaluate and improve predictive models. More advanced topics include deep learning, where neural networks are used to solve complex problems such as image recognition and pattern detection, and natural language processing, which focuses on enabling machines to understand and generate human language. Students also study how AI systems are engineered and deployed in real environments, including the use of cloud platforms, containerisation and automated deployment pipelines.

The BSc (Hons) Computer Science with Artificial Intelligence also addresses the broader context in which computing and AI operate. Students examine ethical, legal and societal issues, including data privacy, bias in algorithms, fairness and accountability. Human-centred design principles are introduced to ensure that systems are usable, accessible and inclusive. Sustainability and the environmental impact of large-scale computing systems are also considered, reflecting the growing importance of responsible innovation.

In the final stage of the BSc (Hons) Computer Science with Artificial Intelligence, students bring together their learning through a substantial Capstone AI Innovation Project. This involves identifying a real-world problem, designing and implementing an AI-based solution, and evaluating its effectiveness using appropriate methods. The project also requires consideration of ethical and professional issues, as well as clear communication of technical work.

	Where will I study? Students who enrolled on the CertHE in Computer Science with Artificial Intelligence or BSc (Hons) Computer Science Artificial Intelligence will be studying at the University of Sunderland in London. Majority of the teaching will be face-to-face. Does the programme have an associated IFY? No
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8	Programme Awards		
8a	Name of Final Award	Level	Credits Awarded
	Bachelor of Science with Honours in Computer Science with Artificial Intelligence	6	360
	Certificate of Higher Education in in Computer Science with Artificial Intelligence	4	120
8b	Exit Awards and Credit Awarded		
	Certificate of Higher Education in Computer Science with Artificial Intelligence	4	120
	Diploma of Higher Education in Computer Science with Artificial Intelligence	5	240
	Bachelor of Science in Computer Science with Artificial Intelligence (Ordinary Degree)	6	300

9	Programme Specific Regulations
	No

10a			
Mode(s) of Study		Location/ Campus	Duration of Study
Full Time BSc Computer Science with Artificial Intelligence		London	3 years
Part Time BSc Computer Science with Artificial Intelligence		London	6 years
Full Time CertHE in Computer Science with Artificial Intelligence		London	1 year
Part Time CertHE in Computer Science with Artificial Intelligence		London	2 years

10b	
Is this programme delivered at a Transnational (TNE) partner ?	Yes
Is this programme delivered at UK Partner Institutions ?	No

11	Entry Requirements
	The admission requirements for this programme as stated on the course page of the University of Sunderland website at https://www.sunderland.ac.uk/, or found by searching for the course entry profile located on the UCAS website are correct. YES This programme is suitable for students to enter with advanced standing (e.g. APL) YES Where applicable use the space below to detail any specific arrangements – e.g. APL only permitted to a specific level Accreditation of Prior Learning (APL)

12	Programme Learning Outcomes
	By the end of Stage 1 of the programme successful students will be able to do the following:
1	Demonstrate knowledge of fundamental computer science principles including programming, data structures, computer systems and mathematics.
2	Apply computational thinking to solve structured problems using appropriate programming techniques.
3	Explain foundational Artificial Intelligence concepts and simple intelligent system architectures.
4	Develop and test basic software applications using professional tools.
5	Demonstrate awareness of professional and ethical responsibilities in computing.
	By the end of Stage 2 of the programme successful students will be able to do the following:
6	Design, implement and evaluate software systems using structured, object-oriented approaches and agile database development methodologies.
7	Apply machine learning techniques to real-world datasets and interpret results critically.
8	Analyse algorithmic efficiency and computational complexity.
9	Evaluate the ethical, legal and societal implications of Artificial Intelligence technologies.
10	Integrate databases, cloud systems and Artificial Intelligence components into scalable solutions.
	By the end of Stage 3 of the programme successful students will be able to do the following:
11	Design and deploy advanced Artificial Intelligence systems including deep learning and natural language processing (NLP) solutions.
12	Engineer production-ready intelligent systems using appropriate architectures and deployment pipelines.
13	Critically evaluate research literature and conduct an independent Artificial Intelligence innovation project demonstrating originality and professional competence.
14	Critically reflect on sustainability, governance and responsible Artificial Intelligence practice.

13. Programme Requirements

There are optional modules on this programme No

Level 4:

In order to complete the CerTHE in Computer Science with Artificial Intelligence or BSc Computer Science with Artificial Intelligence, a student must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value	PLO(s) assessed
LCS1000	Programming and Computational Thinking	30	PLO1, PLO2, PLO4
LCS1001	Mathematics and Algorithms for Artificial Intelligence	30	PLO1, PLO2
LCS1002	Computer Systems and Software Engineering Foundations	30	PLO1, PLO3, PLO4, PLO5
LCS1003	Introduction to Artificial Intelligence and Data	30	PLO3, PLO4, PLO5

Level 5:

In order to complete the BSc Computer Science with AI, a student must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value	PLO(s) assessed
LCS2000	Object-Oriented Design and Database Systems	30	PLO6, PLO10

LCS2001	Machine Learning and Data Analytics	30	PLO7, PLO10
LCS2002	Algorithms, Complexity and Optimisation	30	PLO8,
LCS2003	Responsible AI, Ethics and Human-Centred Computing	30	PLO9, PLO10

Level 6:

In order to complete the BSc Computer Science with AI, a student must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value	PLO(s) assessed
LCS3000	Deep Learning and Intelligent Systems	30	PLO11, PLO14,
LCS3001	Natural Language Processing and Advanced AI Applications	30	PLO11, PLO14,
LCS3002	AI Systems Engineering and Cloud Deployment	30	PLO12, PLO14,
LCS3003	Capstone AI Innovation Project	30	PLO13, PLO14,

14. Employability

The programme contributes to the development of the following graduate attributes.

Professional	The CertHE in Computer Science with Artificial Intelligence fosters the professional attribute by embedding industry-relevant practices and standards throughout the curriculum. Students gain hands-on experience using programming languages, development environments and basic software engineering tools that reflect current workplace expectations. Through practical laboratory work, project-based assessments and portfolio development, they learn to produce work to a professional standard, manage tasks effectively and meet deadlines. The inclusion of technical reporting and presentations strengthens their ability to communicate complex ideas clearly and appropriately for different audiences. Furthermore, ethical considerations such as data privacy, algorithmic bias and responsible AI are integrated across modules, ensuring that students develop an awareness of professional responsibilities and conduct within the computing field. The BSc Computer Science with Artificial Intelligence contributes significantly to the development of professional attributes by embedding industry-relevant practices, standards and behaviours throughout the curriculum. From the early stages, students are introduced to structured software development, version control, testing strategies and technical documentation, all of which mirror professional expectations in computing roles. As they progress, they engage with collaborative projects that require teamwork, communication and project management, often using agile methodologies that are widely adopted in industry. The inclusion of modules focused on systems engineering, cloud deployment and real-world datasets ensures that students gain practical experience with tools and workflows used in contemporary organisations. Professional responsibility is further reinforced through engagement with ethical, legal and governance issues in artificial intelligence, encouraging students to
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	consider accountability, data protection and societal impact. The Capstone AI Innovation Project consolidates these elements by requiring students to independently manage a substantial project, demonstrate technical competence, and communicate their work to both technical and non-technical audiences, reflecting the expectations of graduate-level employment.
Adaptable	The CertHE in Computer Science with Artificial Intelligence supports the development of adaptable graduates by equipping students with strong foundational knowledge and transferable problem-solving skills that can be applied across a wide range of contexts. By focusing on computational thinking, algorithmic reasoning and core principles of computer science, students learn how to approach unfamiliar problems systematically and develop solutions using appropriate tools and techniques. Exposure to a variety of topics including programming, mathematics, systems and AI encourages intellectual flexibility and the ability to connect concepts across domains. The coursework-based assessment model, with its emphasis on continuous feedback and iterative improvement, helps students build resilience, reflect on their learning and adapt their approaches in response to challenges. Adaptability is developed through the BSc Computer Science with Artificial Intelligence programme's emphasis on transferable skills, conceptual understanding and exposure to a wide range of technologies and methodologies. Rather than focusing narrowly on specific tools, the curriculum prioritises underlying principles of computing and artificial intelligence, enabling students to respond effectively to technological change. Students encounter multiple programming paradigms, machine learning approaches and system architectures, which helps them build confidence in learning new technologies and applying knowledge in different contexts. Problem-based learning and project work encourage students to tackle unfamiliar challenges, experiment with alternative solutions and reflect on outcomes. The progression from guided learning in the first year to independent and self-directed work in the final year supports the development of autonomy and resilience. The Capstone project, in particular, requires students to define problems, select appropriate methods and adapt their approach as challenges arise, mirroring the dynamic nature of real-world computing environments.
Engaged	The CertHE in Computer Science with Artificial Intelligence also promotes the engaged attribute by encouraging active participation in learning and awareness of the broader societal context of technology. Students are involved in collaborative activities, discussions and project work that require teamwork, communication and shared problem-solving. Real-world case studies and applied tasks help students understand how computing and AI are used to address contemporary challenges, making learning relevant and meaningful. In addition, the integration of ethical and societal issues such as fairness, inclusivity and the impact of AI on society encourages students to think critically about the role of technology and their responsibilities as future professionals. Opportunities for feedback, reflection and participation in student voice

	mechanisms further support their engagement with both the programme and the wider academic community. The BSc Computer Science with Artificial Intelligence also fosters engaged graduates who are aware of the broader implications of their work and actively connected to their field and society. Engagement is cultivated through the integration of real-world problems, industry-style datasets and contemporary case studies across modules. Students are encouraged to consider how artificial intelligence can be applied to address societal challenges, and to critically examine issues such as bias, fairness, sustainability and ethical responsibility. The dedicated focus on responsible AI and human-centred computing ensures that students understand the importance of designing technologies that are inclusive and socially beneficial. Opportunities for collaboration, discussion and presentation throughout the programme help students develop confidence in sharing ideas and engaging with diverse perspectives. The Capstone AI Innovation Project further enhances engagement by allowing students to work on problems of personal or societal relevance, often culminating in a public presentation of their work. This experience reinforces their role not only as technical specialists but also as contributors to innovation and positive societal impact.
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15. Additional Costs: Are there any additional costs on top of the fees?

List any additional costs the students will have to meet and whether this is optional (e.g. an optional field trip) or essential (e.g. buying a lab coat). Give an estimation of the approximate cost which may be a range. This information should be replicated in the Module Guide and will be published on the course page.

No, but all students buy some study materials such as books and provide their own basic study materials	✓
Yes (optional). All students buy some study materials such as books and provide their own basic study materials. In addition, there are some additional costs for optional activities associated with the programme (see above)	
Yes (essential). All students buy some study materials such as books and provide their own basic study materials. In addition, there are some essential additional costs associated with the programme (see above)	

16. Version Control

Programme Specifications are checked annually and updated when changes are made to the programme.

Version Number		Date	Details of change	Author
V1	Document created	07/04/2026	New programme	Dr Yahaya Alhassan
V2	Document changed			

Version number:	5	Template owner:	Quality Team
Date reviewed:	Jun-24	Date of next review:	Jun-29