BEng (Hons) Software and Artificial Intelligence Engineering

Table 1: Entry year 2026/2027 programme details

Property	Details
Target award	Bachelor of Engineering with Honours (BEng Hons)
Level 6 Exit award	Ordinary Degree of Bachelor of Engineering (BEng)
Level 5 Exit award	Diploma of Higher Education (DipHE)
Level 4 Exit award	Certificate of Higher Education (CertHE)
Level 3 Exit	Foundation Certificate (FdCert)
Exit award title	**Software and Artificial Intelligence Engineering**
Specified variants	**UCAS code I200 3 years full-time** **UCAS code I201 4 years full time with placement or study abroad** **UCAS code I202 4 years full time with integrated foundation year** **UCAS code I203 5 years full-time, integrated foundation and placement/study abroad**
Admissions	September, City Campus UK/Home students and international students (excluding Foundation)
Degree Awarding Body	The University of Bradford
Accrediting Body	The intention if for this programme to seek accreditation from the British Computer Society (BCS). In the interim, this programme is designed to align with the BCS standards and requirements of Association for Computing Machinery (ACM).
External Frameworks/ Reference Points	• FHEQ Framework for Higher Education Qualifications (2024) • Computing (Quality Assurance Agency 2022), Engineering (QAA 2015) • HE Qualifications of UK Degree Awarding Bodies (FHEQ: QAA 2024) and Regulated Qualifications Framework (RQF: Ofqual 2015)

Please note: The University has a set of terms and conditions for all students accepting an offer to study on a course here at Bradford. This is called the Student Contract. This document sets out the Terms and Conditions which apply when an offer of a place on a programme of study at the University of Bradford is accepted. **View our Student Contract for further details**. Information about this programme and its modules has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but changes may occur given the interval between publishing and commencement of teaching. Any change which impacts the terms and conditions of an applicant's offer will be communicated to them.

Introduction

The University of Bradford has a long and proud tradition of providing outstanding Computer Science, Software Engineering and Artificial Intelligence (AI) education. We are committed to continually evaluating and improving our offer to ensure that our students are given the best possible experience whilst studying, and that they are equipped to flourish as safe and effective Software and AI Engineers from the point of professional registration. At the University of Bradford, we provide modern and innovative approaches in how we provide Software and AI Engineering education. Our exemplar curriculum offers students a transformative university experience that empowers students to realise their potential, embrace technology and technology-enhanced learning, and prepare for a flexible career in modern Software and AI Engineering.

Software and Artificial Intelligence technologies are changing. Software Engineering is concerned with building computer systems that are error free and totally reliable, such as safety critical systems in aircraft, industrial plants, smart cities and healthcare. Artificial Intelligence is concerned with cutting edge digital technologies for automation systems leading current digital industry and society revolutions. The general principles of engineering are applied to the production of Software and Artificial Intelligence systems that meet these stringent requirements and expectations.

The BEng (Hons) Software and Artificial Intelligence Engineering programme aims to produce professionally capable, ethically aware, and industry-ready AI engineers who can design, develop, deploy, and evaluate complex software-intensive systems that integrate artificial intelligence techniques.

The programme is grounded in the principles of engineering, computer science, and professional software development, while providing focused and progressive specialism in artificial intelligence, machine learning, and data-driven intelligent systems. It addresses the growing industrial and societal need for engineers who are not only capable of building reliable and scalable software, but who can also embed intelligent behaviour responsibly and effectively within those systems.

The BEng Software and Artificial Intelligence Engineering is offered by the School of Computing and Engineering part of the Faculty of Management, Science and Engineering at the University of Bradford, which includes a renowned tradition of undergraduate and postgraduate programmes concerned with the understanding, design, and exploitation of computation and computer technology. The School also places great emphasis on research and research-informed teaching, and there are opportunities for students to join one of our research teams and their projects, and progress on to postgraduate taught programmes or research degrees on completion of their first degree.

The Bradford Software and Artificial Intelligence Engineer

Our programme aims are based on continuous research-informed knowledge and expertise, and industry-supported expectations and feedback where we identified the skills needed to be the best professional you can be. Through a combination of a shared foundational first year, progressively specialised modules, industry-informed content, and a substantial individual final-year project, the programme aims to produce graduates who are confident, reflective, and capable of contributing responsibly to the development of intelligent software systems in modern engineering contexts.

The early part of the programme concentrates on the general and theoretical foundations of computer science, problem analysis and solving, and professional skills with a further focus on Artificial Intelligence and software engineering topics. It incorporates ideas from many other disciplines, including mathematics, engineering and management and has a close affinity with information and communication technologies as illustrated by the Internet and World Wide Web. The term ‘convergence’ is often used to describe how these disciplines are coming together, and this is how the software and AI engineering builds also on. Later, emphasis moves to the design, implementation, testing and administration of large software and AI systems engineering projects.

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Programme Aims

The academic programme aims are to:

- Provide students with a strong engineering-led foundation in computing, mathematics, and software engineering principles that underpin the design and delivery of dependable, high-quality software systems.
- Develop students’ ability to apply artificial intelligence techniques—including data-driven modelling, machine learning and intelligent decision-making to real-world problems.
- Equip students with the practical skills, tools, methodologies, and standards required to analyse requirements, design architectures, implement solutions, test and validate complex software and AI-based systems across their lifecycle.
- Foster understanding of the professional, ethical, legal, social and sustainability considerations associated with software and artificial intelligence engineering, including issues such as transparency, bias, safety, security, privacy, sustainability and societal impact.
- Enable students to function effectively as computing, software and AI engineers professionals, capable of working individually and collaboratively, communicating with a range of stakeholders, and managing projects using industry-standard practices.
- Support the progressive development of transferable skills, including critical thinking, problem-solving, research, communication, and lifelong learning, to ensure graduates are adaptable in a rapidly evolving technological landscape.
- Provide an inclusive and accessible educational pathway, welcoming students from diverse backgrounds and prior educational experiences, and supporting widening participation in software and AI engineering domains.
- Prepare graduates for a wide range of graduate employment or further study, including

roles in software engineering, AI engineering with data-driven intelligent systems analysis, design, development, testing and deployment, and related professional or postgraduate pathways.

These aims will be achieved by:

A1. Providing students with a core of fundamental modules, in stages 1 and 2 that are essential to all computer scientists, and the next generation of Software and Artificial Intelligence (AI) engineers and expert practitioners, plus specialist modules particularly in the second and final stages, building on the knowledge and understanding gained earlier.

A2. Providing the support in the form of lectures, labs and tutorials that will enable students to develop their personal portfolio of skills and knowledge, in line with the School of Computing and Engineering's commitment to providing a very high standard of academic delivery and environment, supported by up-to-date computing facilities, hardware devices and software tools.

A3. Developing discipline and personal transferable skills so that during studies and on graduation students may move directly into responsible positions in industry or commerce (such as placement, graduate schemes respectively) and as business innovators, or may pursue further programmes of study.

A4. Enabling development of adequate solutions to large-scale real-life problems by adapting and applying fundamental principles and concepts of software and AI engineering, such as languages, tools, techniques, methodologies, standards, quality assurance systems, organisation and management methods.

A5. Promoting educational opportunities and interest in academic development for ethnic minorities, women, mature and alternatively qualified students, as well as for school-leavers and traditionally qualified students.

Programme Learning Outcomes

Graduates of this programme will demonstrate knowledge, skills and professional competences that integrate software engineering principles, artificial intelligence technologies design, development and practice, enabling them to design, implement, evaluate and manage complex, real-world software and AI-enabled systems.

Stage 0: To be eligible to progress onto the degree programme, foundation entry students will be able to:

0.1. Demonstrate knowledge and understanding of mathematics, computer hardware, operating systems and AI to an appropriate standard to allow students to engage with an accredited Computer Science programme.

0.2. Develop basic knowledge and skills in coding, data handing, computer vision and cyber security to support problem-soling and computational thinking required for undertaking a computer science programme.

0.3. Demonstrate knowledge and skills in data management and presentation, IT and communication skills, teamwork, and personal management

Stage 1: To be eligible for the Certificate of Higher Education award at FHEQ level 4, students will be able to:

1.1. Describe the historical development, scope and contemporary roles of software engineering and artificial intelligence.

1.2. Apply basic mathematical, logical and algorithmic principles to solve well-defined computing problems.

1.3. Explain fundamental concepts of data representation, computer architecture and internet technologies, computational thinking and programming.

1.4. Demonstrate practical skills in software design and implementation using appropriate programming languages, tools and development environments.

1.5. Identify professional, ethical, legal, security and sustainability considerations relevant to software and AI systems.

1.6. Work effectively as an individual and as a member of a team, applying essential communication, self-management and professional skills.

1.7. Collect, interpret and present technical information clearly to both specialist and non-specialist audiences.

Stage 2: To be eligible for the Diploma of Higher Education award at FHEQ level 5, students will be able to:

2.8. Apply computer science and software engineering principles to analyse, design, implement and evaluate software systems, using recognised methodologies, standards and tools.

2.9. Analyse data structures and algorithms, assessing their correctness, efficiency and suitability for different problem contexts.

2.10. Design, implement and manage database systems and data-driven applications.

2.11. Demonstrate a working understanding of artificial intelligence techniques, including their application to real-world problems.

2.12. Critically evaluate the ethical, legal, societal and professional impacts of artificial intelligence, including issues of bias, transparency, sustainability and responsibility.

2.13. Apply knowledge of computer communications and networking principles to analyse and support connected and distributed systems.

2.14. Work collaboratively on a substantial team-based software project, managing roles, responsibilities, risks and deliverables (e.g. Enterprise-Pro).

2.15. Design, develop and evaluate large-scale, data-driven and AI-enabled software systems, applying software and AI architectures' analysis, design and engineering principles, and modern technologies.

Stage 3: To be eligible for the Degree of Bachelor award at FHEQ level 6, students will be able to:

3.16. Communicate technical solutions, design decisions and project outcomes effectively to

peers, stakeholders and professional audiences.

3.17. Demonstrate a systematic and critical understanding of advanced software and artificial intelligence engineering concepts, informed by current research and professional practice.

3.18. Apply machine learning techniques, including considerations of cloud deployment, scalability and MLOps, to real-world datasets.

3.19. Critically analyse and integrate issues of ethics, impact and governance in the design, testing and deployment of software and AI systems.

3.20. Select and apply advanced software and AI engineering techniques for reliability, performance, testing and maintainability.

3.21. Undertake an independent, substantial Final Year Project, demonstrating the ability to define a problem, conduct appropriate research, design and implement a solution, and critically evaluate outcomes.

3.22. Critically evaluate research literature and technical sources, recognising uncertainty, limitations and emerging developments in software and AI engineering.

3.23. Exercise professional judgement, initiative and responsibility in managing complex technical work, both independently and collaboratively.

3.24. Communicate complex technical ideas clearly and persuasively through written reports, presentations and demonstrations.

3.25. Demonstrate readiness for professional practice or further study in roles such as software engineer, AI engineer, machine learning engineer, data-driven systems developer, AI officer, AI in education, or related engineering and computing careers.

Student journey

BEng (Hons) Software and AI Engineering is an undergraduate Bachelor of Engineering with Honours degree programme. Students will complete the course in three years of study, from Level 4 in the first year to Level 6 in the final year with the exception of students undertaking a placement year which would be completed in four years.

An English Honours degree is equivalent to a European Higher Education Area first-cycle degree and carries 360 credits (180 European credits). At Bradford, academic content is studied over two Semesters (Sem 1 or Sem 2) with practical learning and independent study sometimes extending into a third part of the year (“Sem 3”).

Because some students take longer to complete for a variety of reasons – from electing to take a year out to work or choosing to study our Foundation Year to gain extra skills and confidence – we refer to each nominal year of study as a stage.

Students can join the programme in Stage 0 (foundation certificate) or Stage 1 (higher certificate) before continuing towards the degree award. Check the **Admissions Requirements** section to see the difference between entry requirements for these stages.

Stage 0 - Level 3 Modules

The Integrated Foundation Year, Stage 0, introduces students to the principles of computing holistically, introducing foundational concepts, frameworks and techniques common to other Engineering and Computing professions before contextualising them for Software Engineering. The year features practical elements where students spend time in laboratories to conduct experiments on engineering applications. Students will be able to develop awareness of the breadth of opportunities and challenges posed by software engineering and the exciting possibilities for their career development. The teaching of Mathematics aims to provide an academic outcome comparable to A-level.

In Stage 0, students will study 120 core credits at RQF Level 3:

Stage 0 Software and AI Engineering Core Modules (RQF Level 3)

Module Code	Module Title	Credit	Period
ENG3500-B	Professional and Independent Learning for Engineering and Computing	20	Semester 1
ENM3003-B	Foundation Mathematics	20	Semester 1
COS3011-B	Computer Skills and Applications	20	Semester 1
COS3009-B	Introduction to Coding	20	Semester 2
COS3003-B	Introduction to Computing	20	Semester 2
GAV3001-B	Introduction to Computer Visualisation	20	Semester 2

Students who successfully complete Stage 0 will progress onto the BEng route's Stage 1.

Stage 1 – Level 4 Modules

The first semester provides an integrated grounding for higher education at the University of Bradford, including study skills, digital awareness, research skills, professional attitudes and values, critical self-reflection, and communication skills. Theory modules introduce key principles and form a basis for learning in subsequent years. Students start developing the critical mindset essential for success and get an individualised learning plan to organise academic skills, explore contemporary debates and understand the context of computer science, software engineering and artificial intelligence. Students study 6 core modules in Stage 1:

Stage 1 Software and AI Engineering Core Modules (FHEQ Level 4)

Code	Module Title	Credit	Period
COS4016-B	Fundamentals of Programming	20	Semester 1
COS4014-B	Mathematics for Computing	20	Semester 1
COS4015-B	Technical and Professional Skills	20	Semester 1
COS4001-B	Computer Architecture and Systems Software	20	Semester 2
COS4018-B	Internet Technologies	20	Semester 2
COS4017-B	Software Design and Development	20	Semester 2

Stage 2 – Level 5 Modules
Students study 6 core modules in Stage 2**:**

Stage 2 Software and AI Engineering Core Modules (FHEQ Level 5)

Code	Module Title	Credit	Period
COS5028-B	Artificial Intelligence	20	Semester 1
COS5021-B	Data Structures and Algorithms	20	Semester 1
COS5020-B	Database Systems	20	Semester 1
COS5025-B	Computer Communications and Networks	20	Semester 2
COS5019-B	Enterprise-Pro	20	Semester 2
COS5032-B	AI: Ethics and Impact	20	Semester 2

Students completing Stage 2 will progress to Stage 3 or the elective placement/study abroad year. See the **Placement and/or Study Abroad** section below for more details.

Stage 3 – Level 6/7 Modules
At Stage 3, students take 80 core credits including the Final Year Project and select 2 optional modules: one Master's level module in Semester 1 and one Level 6 module in Semester 2**:**

Stage 3 Software and AI Engineering Core and Option Modules (FHEQ Level 6/Level 7*)

Code	Module Title	Credit	Period	Selection
COS6006-D	Final Year Project	40	Academic Year	Core
COS6009-B	Large Scale Data Driven Applications	20	Semester 1	Core
COS7025-B*	Mobile Application Development	20	Semester 1	Option 1
COS7057-B*	AI in Education	20	Semester 1	Option 2
COS6028-B	Software Systems Design and Testing	20	Semester 2	Option 3
COS6012-B	Concurrent and Distributed Systems	20	Semester 2	Option 4
COS6026-B	Machine Learning	20	Semester 2	Core

Environment and Student Journey

Students will experience a wide range of teaching and learning environments during their degree studies, with each method of supporting learning carefully chosen to best embed and grow skills and knowledge. Flexibility and variety in the learning experience is a core concept of our courses, and a range of physical spaces and online tools will help students learn in a connected environment that supports them through a challenging educational journey. Concepts, principles and theories are explored in formal lectures, explored in associated tutorials and seminars, and realised in laboratory classes. During the course, students will experience a spiral-approach to learning, with each stage building an ever-growing knowledge base and skill set based on foundations from past learning, In addition, critical real-world concepts and transferable skills form a backbone for further learning through a set of key modules within the programme.

Professional and personal skills are developed through the Technical and Professional Skills module (Year 1) which involves communications skills, library skills, group work and presentations. The Enterprise-Pro module (Year 2) develops an appreciation of how to manage group dynamics whilst working on a substantial computing and software engineering exercise. Honours students undertake a major individual project in their final year, drawing together the knowledge and experience gained throughout the programme. The project provides the opportunity for students to demonstrate the ability to solve problems using current ideas and current, innovative techniques that are at the forefront of computing and applied multidisciplinary disciplines, and to explore their own creative abilities in both the selection of existing tools and algorithms, as well as the creation of new content and ideas towards a defined goal.

In the final year students will choose from a small number of optional modules in each semester, carefully selected to allow individual tailoring of the degree programme, reflecting our commitment to student agency within their course. All options will relate strongly to Software and AI Engineering and specialist underlying Computer Science discipline that it is built upon and will complement the pinnacle of self-directed liberated learning within all our courses; the individual Final Year Project, where students are free to create their own project from scratch with careful support from an academic supervisor and subject expert.

Curriculum design: what it means for you

A number of ‘themes’ within the programme will develop and build during the student journey, using a spiral approach whereby concepts and practical skills are built on and enhanced as students pass through each year of the course. In addition to the transferable skills and practical project themes described above, other themes cross the course:

Computer programming skills, to build tangible skills in creating software, begin in year one with Fundamentals of Programming, Technical and Professional Skills and Software Design and Development that will cover the essentials of writing and designing computer code using Python and Java. Continuing in year 2 through Enterprise Pro and Data Structures and Algorithms which both help develop coding skills through practical lab exercises, as well as Database Systems in terms of connecting data sources to software. In the third year this theme will be supported in Large Scale Data Driven Applications and showcased in the Final Year Project (with additional AI: Machine Learning content expected) with students shown how to design and write testing code and work with complex topics around concurrency (through the relevant optional modules) to create more real world solutions to programming problems.

An AI Engineering specific theme is obvious for this course, but formally begins in year one with Technical and Professional Skills introducing the topic in an approachable way through examples such as autonomous vehicles and generative AI (e.g. ChatGPT), building in year two through two specific modules with heavy AI content (Artificial Intelligence and AI: Ethics and Impact) that cover topics in greater depth and widen the focus to include additional subjects such as visual AI, data driven problems such as modelling and prediction, as well as greater depth in cutting edge topics like AI generation of text, video and games. In the 3rd year through Machine Learning and the

optional Ai in Education, students will learn to develop AI applications and advanced predictive models on a variety of data, and test them in the optional Software Systems Design and Testing module.

A hardware theme crosses all years to enhance student understanding of the devices that run code, starting with Computer Architecture and Systems Software in year one which covers binary systems memory, processors and storage devices. Continuing and building via Computer Communications and Networks in year two, which introduces communication techniques such as protocols and encryption concepts, and further supported in the third year with Large Scale Data Driven Applications as well as the optional Concurrent and Distributed Systems that build on hardware knowledge to assess specifications and requirements for more realistic problems from the real world.

Study skills and support

Each 20-credit module on the programme requires students to commit to 200 hours of study. Many of these hours will be formally timetabled - lectures, laboratories, seminars and tutorials – and others will involve students carrying out private study or group work. The balance between these forms of study changes as students pass through the three years of the programme, reflecting an increasing ability for students to work independently using their newfound skills to start shaping their future and the future of the discipline.

We aim to provide a nurturing and supportive environment that enables students to become independent learners and problem solvers, while encouraging and embracing each students' individuality and personal circumstances. This journey begins in the first year through dedicated content on problem analysis and algorithmic thinking, as well as exposure to the wider network of researchers and research publications underpinning progress in AI that many students will have never seen before. The BEng Software and AI Engineering programme links to the interdisciplinary Artificial Intelligence Research (AIRE) group at the University that offers an opportunity to promote the research active aspect of our School and the links to innovative research that inform the teaching on our courses. Examples of funded projects and demonstrable research outcomes are available, and we promote the unique expertise of both academic staff and PhD students within the group as an opportunity to gain experience from genuine AI experts. Additionally, AIRE is the academic liaison for the **Turing University Network** that offers additional opportunities for knowledge exchange, communications, and materials from internationally and nationally leading research groups.

A Personal Academic Tutor will accompany each student through their degree journey, providing pastoral care and support for all the aspects of higher education that take place outside of the lecture theatre or lab. Students will be supported via various approaches including (for example) learning in small groups and in practical laboratory sessions where discussions and formative feedback are embedded, having the support of lecturers, demonstrators and project supervisors, who all provide further academic support and guidance.

Students will also have the opportunity to be part of the University of Bradford Computing Society for students, PiSoc, as well as the Peer Assisted Learning (PAL) scheme, where students are able

to meet with other fellow students at different stages of their study, across our range of degree programmes. The initiatives will showcase the community aspect of the higher education experience, empowering our students' voices and opinions as they explore a discipline and its impact on the world together, collaboratively.

We use a virtual learning environment, Canvas, to share course materials and reading lists, communicate with students, track student participation, facilitate discussions, support formative and summative assessments and provide feedback. Students can use Canvas independently to revise materials, ask questions and interact with lecturers and other students using discussions, practise and assess their understanding using quizzes, or for finding resources for further reading, seamlessly from anywhere at any time. In addition to the standard technology enhanced learning approaches, we embed technologies to deliver key concepts in an interactive environment that strongly links theory with practical skills. Our Virtual Desktop Infrastructure allows students to connect to powerful servers that create ad-hoc virtual machines for use in our labs, as well as from outside of the University, further embedding our commitment to supporting learners flexibly. Our Enterprise-Pro module (level 5) supports students to develop their projects using an industry standard tool for collaborative team-based software development, mirroring real world industry practices to further grow their employment prospects.

Innovative projects initiated by industry are also embedded within a number of the modules, such as Technical and Professional Skills (level 4), Enterprise-Pro (level 5) and Final Year Project (level 6), through our Computing Enterprise Centre, allowing students to work on topics that are highly relevant to their future careers throughout the course, and building the authentic experiential based skillset that employers look for. Students will also have the opportunity to interact with our Independent Computing Industry Advisory Board members and a wider audience of industry contacts during the Final Year Project Showcase, which allows them to demonstrate their work and to receive feedback and ideas from professionals within the discipline, enhancing their awareness of the changing nature of the discipline and equipping them with knowledge to manage their future career choices and direction.

Placement and/or Study Abroad

This programme provides the option for students to undertake a work placement or period of study abroad between the 2nd and 3rd years of the BEng. Students wishing to take this option will be encouraged to register for the placement year programme. All School of Computing and Engineering students are encouraged to apply for Industrial Placements (Year in industry). Timetabled Pre-Placement lectures and Timetabled 'drop-in' sessions will be scheduled to support students throughout the pre-placement process. All placement opportunities received are made available to students on the placement route via the VLE.

Any placement or period of study abroad is subject to approval by the Programme Team. Students who wish to participate in a placement or period of study abroad will be required to find, apply for and make the most of their chosen opportunity, and will be supported in doing so by the Programme Team, the Faculty Academic Lead for Placements, as well as the central University Careers and Employability Service.

Students on placement or study abroad will be registered for the optional FHEQ Level 5 modules **ENG5002-Z (Placement)** or **ENG5004-Z (Study Abroad)** and encouraged to complete a diary and portfolio presentation of their activity, as completing this module on return to the University will enable evidence to be added to the academic transcript or HEAR.

Students funded by the Lifelong Learning Entitlement (LLE) or international students on a UKVI Student Visa should be aware that there may be financial restrictions that apply to your funding around resits or restudy for your course if you take a placement or study abroad year. You must get advice from the Student Life Service if this may affect you before applying for placement or study abroad.

Our placement scheme also provides students with the opportunity to work in a company for up to one year in the UK or abroad as part of their studies. The student societies with links to professional bodies afford further opportunities for students to engage with industry, such as the student Computing Society Pi Soc as the first ever BCS Student Chapter, and our ACM Student Chapter and the newest initiative - Association for Women in Computing at University of Bradford (AWC@UoB). The School encourages and offers support to these societies in their participation in industry and research led activities including programming competitions, data dives and extra-curricular collaborations and visits.

Further information about **internships and placements** and **study abroad opportunities** is published on the University's website.

Next steps
After completing the programme, you'll be a well-rounded and confident early career professional in Software and Artificial Intelligence Engineering who can contribute leading changes that are required to provide the best possible professional contributions in regional, national and international ecosystems.

More specifically, graduates will be well placed to go on to work in roles that deal with data management and AI development, machine learning and content generation in a huge range of industries, thanks to the AI specific modules within the course. Roles that may specifically suit graduates from this course include Data Engineer, Software Engineer and AI Engineer, focussed roles such as Natural Language Processing developer, tester and engineer, Machine Learning model/pipeline architect, AI Officer, AI-based software specialist and many more.

The University of Bradford equips all graduate examples with the skills to make software and AI and to give examples where and when individuals need them: in collaborative working, in the community, industry and at home. We will help our Software and AI Engineers understand how they can empower people, governing bodies and businesses, as well as understand their role with the power of evidence and examples.

Most undergraduate and postgraduate programmes offered by our School are accredited by the **British Computer Society (BCS) - The Chartered Institute for IT** and computing professionals and/or aligned to the requirements of the **Association for Computing Machinery (ACM)**. The intention is for this programme to also seek accreditation from the British Computer Society (BCS).

In the interim, this programme is designed to align with the BCS standards and requirements of Association for Computing Machinery (ACM). Once the programme has been accredited graduates from the programme may be exempted from some further examinations for professional registration and ensures that graduates are not only exposed to industry throughout their course but also are employment-ready upon graduation

Learning, teaching and assessment strategy

This course embodies the critical and ever-changing role that Artificial Intelligence is playing in the modern world. Built on a foundation of Computer Science topics underpinning the advanced and revolutionary application of AI to real world problems, students graduating from this course will be equipped to shape the future of the discipline, with the confidence to develop practical solutions from an initial idea, through a design process that integrates ethical and social impact into the core of a solution using critical thinking skills, to the implementation and testing of a solution against defined criteria for success.

Programme teaching and learning
Learning and teaching methods include face-to-face seminars and workshops, synchronous, and asynchronous lectures, and self-directed activities. Virtual learning environments (VLE) support face to face learning from tutors. Canvas hosts quizzes, vlogs, blogs and video resources and additional learning resources and material to prepare students for flipped classroom experiences and practical sessions. Further material is provided on this VLE platform to consolidate your learning.

Our learning and teaching strategy integrates student choice wherever we can, from forming groups for team-based learning, through data and topic choices in both research and hands-on modules allowing students to explore their own personal interests and career aspirations in a guided and supportive environment, to the creation of their own custom project in the final year that gives them the freedom to imagine novel solutions and solve problems that are important to both them and the wider community of Software Engineering, AI and Computing experts that they will join after graduation.

The learning and teaching on the programme are informed by industry and by staff undertaking KTP projects, UK and EU funded research projects and consultancy work that embed new knowledge and concepts into our teaching materials and curriculum planning; and inviting industrial speakers. Throughout the academic year industry speakers and researchers are also invited to give talks and lectures to inform and inspire our students about current and future developments within their disciplines. With this, and more, we aim to showcase the depth and breadth of this discipline and inspire students through the passion and dedication of our teaching staff and our wider network of experts and end-users that shape our curriculum, including students themselves through participatory experiences outside of their timetabled sessions.

Our approach to Learning and Teaching on this course is built on decades of experience and success in Computing degree programmes. Our aim is to empower graduates with the practical experience and critical analysis skills necessary to succeed in an Software and AI Engineering career, with the flexibility to explore broader employment opportunities thanks to core content in

this programme that underpins the development and application of AI to the real world. This journey begins in our common first year, where students will be introduced to fundamental concepts and practical activities that will develop their understanding of how computational systems function, and how technology that underpins our modern world are built and used. In the second year of the course, specialised modules on AI are introduced, building knowledge of specific algorithms and tools used in their creation and operation, as well as more core Computer Science topics that support the breadth of employment directions for graduates. The final year continues to develop this widening awareness and depth of practical experience in our students. They will undertake a major independent project, from ideation, through design, to implementation and validation of the outputs. Throughout the course students will be challenged and empowered to apply creative, yet critical, thinking in the design and implementation of their work.

Programme assessment

Methods of assessment are varied, and progress will be assessed using a mix of formal examinations, presentations and seminar papers, reports, laboratory tests, essays, coursework assignments, and projects. This varied approach embodies the Liberated Learning strategy at Bradford, where we empower students to demonstrate their skills and knowledge using a wide variety of formats. In recent years we have moved towards greater use of coursework-based assessments where possible, with the goal of embedding even more learning opportunities through formally assessed work. Work that contributes to final degree results are an excellent opportunity to develop further skills, rather than simply measuring attainment of a learning outcome. Assessments aim to inform and educate, as well as measure, and examples such as programming through games, building a website, researching current AI technologies and their impact and developing machine learning models all reflect our commitment to enthuse and engage students at every opportunity.

Consideration of students' of varying ability levels are incorporated wherever possible in module assessments, either through carefully crafted marking schemes that indicate how the highest marks can be achieved through additional depth and complexity, or through more open topic/data choices in modules where students can make choices within the assessment framework to take on more challenging problems and demonstrate higher attainment of the learning outcomes. Examples of this include first year assessments such as that in Fundamentals of Programming, that has an open-ended final task to develop functionality through code of the students own ideas, with a portion of marks reserved to reward their innovative and high-level additions. Students with learning adjustment requirements are supported through consideration of deadline extensions, one-to-one feedback in lab sessions and through the Personal Academic Tutor systems where any concerns can be discussed privately with a tutor towards a more tailored assessment approach that considers their individual needs.

Formative assessments, those that do not contribute to marks, are also used to allow feedback to be provided, strengths and areas of improvement to be identified. These are usually strongly linked with summative assessment, those that are marked, to provide student with a safe environment to develop their skills and be guided by our expert teaching colleagues.

Assessment literacy issues will be covered generally in the first year through individual modules, with co-ordinators making requirements and restrictions clear to students in an assessment

specific way. In addition, general literacy regarding AI tools will be covered in Technical and Professional Skills, which will also cover group work procedures such as communication and proportional awarding of marks based on individual contributions, further strengthened in the Enterprise Pro module in year 2.

Our curriculum development is informed by the research conducted by academic members of staff within the School, exposing students to current developments within the related fields of expertise. Staff will inform and inspire students about current research directions, as well as building student skills for research and inquiry. Our aim is to support student engagement with knowledge sources, equipping them to knowledgably assess sources and claims from publications towards strengthening public engagement with science and peer-reviewed publications that share knowledge and results. Knowledge and experience from Industrial partners are also integrated within the programme through both our Industry Advisory Board and research projects through case studies, lab-based activities and invited talks, ensuring that research findings are at the heart of our curriculum.

All our staff have attained, or are working towards, Fellowship of AdvanceHE, a professional standards body for Higher Education practitioners. As part of our commitment to Excellence in Learning and Teaching, we conduct research into innovative and effective teaching and assessment methods. For example, assessment for our Final Year Project module was enhanced by incorporating regular formative and summative feedback opportunities to enhance the final outcomes, based on a research project conducted by staff within the School that culminated in a journal publication.

Programme regulations

This programme follows the Assessment, Continuation and Award regulations for undergraduate taught courses published on the University's Website (**Regulation 2**).

Exit awards specified in the regulations are available to students who meet the credit requirements and programme learning outcomes for an award but have not completed the full programme. Students who leave the University before completing Stage 0 may have a Foundation Certificate award recognised if they have successfully completed 120 credits at RQF Level 3 and achieved the stage learning outcomes 1-3. THE FD CERT AWARD and all other exit awards DO NOT CONFER ELIGIBILITY TO REGISTER WITH BCS.

Entry and admission requirements

We are proud to be **one of the most inclusive universities in the UK**. All our students have potential, and we believe that as many people as possible should have the chance to benefit from higher education, no matter what their background or circumstances. We take the time to understand the background of our applicants, understand their journey to education, and make decisions based on an applicant’s potential to thrive at university and beyond.

People thinking of studying with the University of Bradford don’t need to wait for the start of the year to contact our Disability Service. The University can arrange for anyone to talk to this team about what support is on offer at Bradford including an invitation to our Get Set Day. To contact the

Disability Service please complete the **request support form**.

Minimum requirements
The programme is taught in English and uses numeracy, so all applicants are required to have proficiency at GCSE Grade 4 (national grade C) or above in English Language and Mathematics. Alternative, equivalent RQF Level 2 qualifications such as Key Skills are also acceptable.

For international students, the level of English required is listed on the **University of Bradford English language requirements website**. International applicants who do not meet the IELTS requirement can take a **University of Bradford pre-sessional English course**, which takes 3 to 10 weeks, or can look at taking a pathway with our **International College** from one term to a year.

Academic entry requirements
Applicants to the programme should have a keen interest in computer science and artificial intelligence with a passion for learning more about how software is built and how it integrates concepts and functionality enabled through AI, but do not require subject specific computing or IT related qualifications.

A typical offer to someone seeking entry to Stage 1 through the UCAS scheme would be a minimum of 112 UCAS tariff points - BBC at A-level. Scores in other qualifications to meet this requirement are on the main course page.

We are committed to raising aspirations and widening access to higher education, regardless of your background. The **University of Bradford Progression Scheme** welcomes Ucas Stage 1 applicants from a number of groups including adult learners who are 21+ on the first day of term, British armed forces families, carers and care experienced learners, estranged or orphaned learners, refugees and asylum seekers, and Romani or Traveller family members.

To enter Stage 0 (foundation year), 64 Ucas points are required. See the integrated foundation year page for ways to join this course.

Recognising prior learning
Applications are welcome from students with non-traditional qualifications, and/or significant personal/professional experience. Students applying this way may be interviewed.

If applicants have prior certificated learning or professional experience which may be equivalent to parts of this programme, the University of Bradford has procedures to evaluate and recognise this learning to provide applicants with exemptions from specified modules or parts of the programme. Find more information about **recognition of prior learning decisions** on the University website.

Information in this document is for the contemporary recruitment cycle and was accurate at time of publication. The current tariff and accepted qualifications for entry onto the programme is published at the online course pages:
https://www.bradford.ac.uk/courses/ug/software-ai-engineering/
https://www.bradford.ac.uk/courses/ug/software-ai-engineering-integrated-foundation-year/

