

ULSTER UNIVERSITY COURSES

List of courses available:

- a. Artificial Intelligence – Msc
- b. Computer Science – Msc
- c. Internet of Things - MSc

1. Artificial Intelligence - MSc

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2024/25 Full-time Postgraduate course

Award: Master of Science

Faculty: Faculty of Computing, Engineering and the Built Environment

School: School of Computing

Campus: Belfast campus

Start dates:

September 2024

January 2025

Overview

Creating the next generation of high quality professionals for the AI industry.

Summary

The MSc in Artificial Intelligence is a specialized program aimed at preparing students for careers in various AI-related fields, including computing, knowledge representation, reasoning, robotics, machine learning, deep learning, neural networks, natural language processing, and data analytics. It also provides a foundation for further research studies. The course is supported by advanced infrastructure, including pervasive and mobile computing environments, sensing technologies, and rapid prototyping facilities. Informed by leading research and strong industry partnerships with BT and PwC, the program responds to industry demand for AI skills and addresses a market gap in postgraduate education. It is accredited by BCS for Partial CITP and Partial CEng. Ulster University's School of Computing, which holds an Athena Swan Bronze Award, encourages female applicants due to their underrepresentation in postgraduate taught courses.

Modules

The MSc program comprises six compulsory modules totaling 120 credits, alongside a substantial 60-credit independent Masters Project. The modules include:

1. Data Science and Machine Learning: Focuses on the data science process, including mathematical and statistical foundations for exploratory data analysis, and practical skills for applying supervised and unsupervised machine learning algorithms to real-world data.
2. Deep Learning and Its Application: Covers the fundamentals of deep learning, neural network construction, and the development of deep learning algorithms, with applications in computer vision and natural language processing.

3. Robotics & AI: Provides an overview of smart robotics and AI, with hands-on experience in programming smart robots, focusing on designing and implementing AI behaviors in robotics.

4. Knowledge Engineering: Explores modern topics in knowledge representation and reasoning, including decision making, automated reasoning, and the semantic web, with practical skills in building knowledge-based applications.

5. Intelligence Engineering and Infrastructure: Teaches best practices for engineering, deploying, and testing AI systems, covering machine learning, data engineering, production pipelines, and automated processes.

6. Emerging and Advanced Topics in AI: Examines cutting-edge AI theories, algorithms, and applications, as well as ethical issues like privacy and fairness. It emphasizes independent learning, research skills, and practical application of advanced AI systems.

Students will gain both theoretical knowledge and practical skills across these diverse aspects of artificial intelligence.

Attendance

Typically 15 timetabled hours per week Monday – Friday including lectures, tutorials and practicals in the computer labs for the taught components of the course. Research Project takes place in the final semester separately.

Start dates

September 2024

January 2025

Teaching, Learning and Assessment

Teaching is delivered through lectures, directed tutorials, seminars, and practical sessions, some of which are by industry professionals / researchers. The course is assessed by 100% coursework.

Attendance and Independent Study

The course induction provides information on organization, attendance, and assessment requirements, typically outlined in a timetable. Full-time course timetables are finalized close to the start date, while part-time courses specify attendance in the offer letter. A course handbook is provided.

Modules are assigned credit points, each representing 10 hours of effort. Undergraduate courses have 10-40 credit modules, and postgraduate courses have 15-30 credit modules. Full-time undergraduates typically take 120 credits per year, equating to 36-42 hours of study per week, including both in-person and online activities. Part-time study is proportional.

Postgraduate Master's programs usually consist of 180 credits over three semesters. PGCerts are 60 credits, typically completed part-time in one year, and PGDips are 120 credits, usually completed in two years. Class contact hours vary, with at least 3 hours per week for lecture-based modules and more for lab-based ones. Course structures may change for quality reasons, with student consultation on significant changes.

Assessment

Assessment methods vary by module and can include exams, coursework, or a combination of both, designed to evaluate the achievement of specific learning outcomes. Students receive timely feedback, either individually or in groups, to aid their development. Coursework may take various forms, such as essays, reports, presentations, dissertations, designs, portfolios, or group work.

The specific assessment methods and their combinations are provided in advance through various resources, like the course handbook and assessment brief. These details may change annually for quality improvements, with students being consulted on significant changes.

Typically, a module has four learning outcomes and no more than two assessment items, which can include multiple tasks. The workload and assessment types are standardized. The pass mark for undergraduate courses is 40%, while for postgraduate courses, it is 50%.

Calculation of the Final Award

The class of Honours for Bachelor's degrees is determined by an aggregate mark based on module performance in the second (Level 5) and third (Level 6) years. Level 6 contributes 70% and Level 5 contributes 30% to the final classification. For integrated Master's degrees with Honours, the calculation includes a Level 7 component, with the breakdown being 50% Level 7, 30% Level 6, and 20% Level 5. At least half of the Level 5 modules must be completed at the University for inclusion in the calculation. Other qualifications base the overall grade on results from the final level of study. For Master's degrees with more than 200 credit points, the final 120 points typically determine the overall grade. This information reflects data from the 2022-2023 academic year.

Academic profile

The School of Computing's academic staff are well-qualified, with most holding a Postgraduate Certificate in Higher Education Practice. About 89% are HEA fellows or higher, and the staff includes Professors (22%), Readers/Senior Lecturers (28%), and Lecturers (50%).

University-wide, over 1,000 academic staff are employed, 60% with PhDs. Courses are taught by Professors (19%), Readers/Senior Lecturers (22%), and Lecturers (57%). Around 82% have qualifications for higher education teaching, and 85% are recognized as HEA fellows. Staff profiles are available online, and staffing may vary annually. Occasionally, part-time staff and guest lecturers, inducted through the University's development program, may also teach courses. This data pertains to the 2022-2023 academic year.

Belfast campus

2-24 York Street, Belfast, BT15 1AP

Accommodation

High quality apartment living in Belfast city centre adjacent to the university campus.

Entry Requirements

Applicants need:

1. A second class honours degree or better in a relevant discipline, or equivalent qualifications such as a Graduate Diploma or Postgraduate Certificate.

2. English language proficiency, with a minimum Academic IELTS score of 6.0 (no band less than 5.5) or equivalent.

For non-standard applicants, significant relevant experience and a portfolio may be considered. Other recognized English language tests are also accepted.

English Language Requirements

English language requirements for international applicants

The minimum requirement for this course is Academic IELTS 6.0 with no band score less than 5.5. Trinity ISE: Pass at level III also meets this requirement for Tier 4 visa purposes. Ulster recognises a number of other English language tests and comparable IELTS equivalent scores.

Fees and funding

Fees Notice - September Start

Northern Ireland, Republic of Ireland, and EU Settlement Status: £7,000
International: £17,090

Additional Costs:

- Accommodation, travel, and living expenses are extra.
- Additional mandatory costs, if any, will be highlighted.
- Students may incur fees for graduation, exam resits, and library fines.
- Costs for work placements or study abroad include extra travel, living, and tuition fees.

For the most current fees, refer to the student guide.

2. Computer Science - MSc

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2024/25 Full-time Postgraduate course

Award: Master of Science

Faculty: Faculty of Computing, Engineering and the Built Environment

School: School of Computing

Campus: Belfast campus

Start dates:

September 2024

January 2025

Overview

Creating the next generation of high quality professionals for the AI industry.

Summary

The MSc in Computer Science is designed to prepare students for careers in industry or research by providing a deep understanding of advanced computing concepts, including algorithms, AI, and the Internet of Things. The program addresses industry demand for skilled professionals who can manage data, understand business processes, and integrate solutions into larger systems.

It features state-of-the-art facilities and is supported by strong industry partnerships with BT and PwC. The course is accredited by BCS for Partial CITP and Partial CEng. The School of Computing at Ulster University, which holds an Athena Swan Bronze Award, encourages female applicants due to their under-representation in postgraduate courses.

Modules

Compulsory Modules (40 credits):

1. Scalable Advanced Software Solutions: Focuses on modern development concepts like containerisation, cloud architectures, and high-performance computing.
2. Data Science and Machine Learning: Covers data analysis, machine learning algorithms, and practical programming for real-world datasets.

Optional Modules (80 credits), including:

- Cyber Security: Examines recent advancements in theory, practice, and policy, addressing threats and ethical issues.
- Deep Learning and Its Application: Covers neural networks, deep learning algorithms, and their applications in computer vision and NLP.
- Digital Transformation: Explores how digital technologies disrupt industries and strategies for successful digital transformation.
- Big Data and Infrastructure: Focuses on data storage paradigms, cloud computing, and distributed computing.
- IoT Networks and Protocols: Evaluates IoT concepts, standards, and the impact on privacy and sustainability.
- Software Product Management: Teaches skills for managing software product lifecycles and market success.
- Robotics & AI: Provides hands-on experience with smart robotics and AI technologies.
- Pervasive Computing: Surveys pervasive computing systems and emerging technologies with practical case studies.
- Knowledge Engineering: Covers knowledge representation, reasoning, and building knowledge-based applications.
- Intelligence Engineering and Infrastructure: Focuses on best practices for engineering, deploying, and testing AI systems.
- Emerging and Advanced Topics in AI: Reviews cutting-edge AI theory, applications, and ethical issues.
- Embedded Systems and Sensors: Teaches about embedded systems and their role in IoT applications.
- Human Computer Interaction and UX Research: Explores HCI and UX practices, including data analysis and literature review.

Note: Optional modules run based on student demand each academic year.

Attendance

Typically 15 timetabled hours per week Monday – Friday including lectures, tutorials and practicals in the computer labs for the taught components of the course. Research Project takes place in the final semester separately.

Start dates

September 2024

January 2025

Teaching, Learning and Assessment

Teaching is delivered through lectures, directed tutorials, seminars, and practical sessions, some of which are by industry professionals / researchers. The course is assessed by 100% coursework.

Attendance and Independent Study

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Modules are assigned credit points, each representing 10 hours of effort. Undergraduate courses have 10-40 credit modules, and postgraduate courses have 15-30 credit modules. Full-time undergraduates typically take 120 credits per year, equating to 36-42 hours of study per week, including both in-person and online activities. Part-time study is proportional.

Postgraduate Master's programs usually consist of 180 credits over three semesters. PGCerts are 60 credits, typically completed part-time in one year, and PGDips are 120 credits, usually completed in two years. Class contact hours vary, with at least 3 hours per week for lecture-based modules and more for lab-based ones. Course structures may change for quality reasons, with student consultation on significant changes.

Assessment

Assessment methods vary by module and can include exams, coursework, or a combination of both, designed to evaluate the achievement of specific learning outcomes. Students receive timely feedback, either individually or in groups, to aid their development. Coursework may take various forms, such as essays, reports, presentations, dissertations, designs, portfolios, or group work.

The specific assessment methods and their combinations are provided in advance through various resources, like the course handbook and assessment brief. These details may change annually for quality improvements, with students being consulted on significant changes.

Typically, a module has four learning outcomes and no more than two assessment items, which can include multiple tasks. The workload and assessment types are standardized. The pass mark for undergraduate courses is 40%, while for postgraduate courses, it is 50%.

Calculation of the Final Award

The class of Honours for Bachelor's degrees is determined by an aggregate mark based on module performance in the second (Level 5) and third (Level 6) years. Level 6 contributes 70% and Level 5 contributes 30% to the final classification. For integrated Master's degrees with Honours, the calculation includes a Level 7 component, with the breakdown being 50% Level 7, 30% Level 6, and 20% Level 5. At least half of the Level 5 modules must be completed at the University for inclusion in the calculation. Other qualifications base the overall grade on results from the final level of study. For Master's degrees with more than 200 credit points, the final 120 points typically determine the overall grade. This information reflects data from the 2022-2023 academic year.

Academic profile

The School of Computing's academic staff are well-qualified, with most holding a Postgraduate Certificate in Higher Education Practice. About 89% are HEA fellows or higher, and the staff includes Professors (22%), Readers/Senior Lecturers (28%), and Lecturers (50%).

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Belfast campus

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Accommodation

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Entry Requirements

Applicants need:

1. A second class honours degree or better in a relevant discipline, or equivalent qualifications such as a Graduate Diploma or Postgraduate Certificate.
2. English language proficiency, with a minimum Academic IELTS score of 6.0 (no band less than 5.5) or equivalent.

For non-standard applicants, significant relevant experience and a portfolio may be considered. Other recognized English language tests are also accepted.

English Language Requirements

English language requirements for international applicants

The minimum requirement for this course is Academic IELTS 6.0 with no band score less than 5.5. Trinity ISE: Pass at level III also meets this requirement for Tier 4 visa purposes. Ulster recognises a number of other English language tests and comparable IELTS equivalent scores.

Fees and funding

Fees Notice - September Start

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Additional Costs:

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3. Internet of Things - MSc

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2024/25 Full-time Postgraduate course

Award: Master of Science

Faculty: Faculty of Computing, Engineering and the Built Environment

School: School of Computing

Campus: Belfast campus

Start dates:

September 2024

January 2025

Overview

Creating the next generation of high-quality practitioners for the IoT industry.

Summary

The MSc in Internet of Things is a one-year, intensive program designed to equip students with skills in Computing Science, Engineering, and Data Analytics. It covers advanced topics such as Sensor Technology, Networks, Security, and Big Data in the IoT field.

Supported by state-of-the-art facilities and informed by leading research and industry partnerships, including a £28.6 million collaboration with BT, the course prepares students for careers in Smart Cities, Industrial IoT, Connected Health, and Smart Homes. It is accredited by BCS for Partial CITP and Partial CEng and offers a pathway to further research. The School of Computing at Ulster University, holding an Athena Swan Bronze Award, encourages female applicants due to their under-representation in postgraduate programs.

Modules

The MSc award includes six compulsory modules (120 credits) and a significant independent Masters Project (60 credits). The core modules are:

Data Science and Machine Learning: Covers data science processes, mathematical and statistical foundations, and machine learning algorithms with practical programming skills.

- Cyber Security: Focuses on recent advancements in cyber security, including theory, practice, policy, and security standards, and addresses threats and ethical issues.

- Big Data and Infrastructure: Explores database and data storage systems, big data challenges, cloud computing, and distributed computing with practical tools like MapReduce and Spark.

- IoT Networks and Protocols: Examines IoT concepts, standards, protocols, and their impact on privacy and sustainability.

- Pervasive Computing: Provides an in-depth understanding of pervasive computing and its applications, including developing solutions for wearable and smart home technologies.

- Embedded Systems and Sensors: Focuses on embedded systems used in communications, automotive, consumer electronics, and medical devices, with an emphasis on feasibility, reliability, and security in IoT applications.

Attendance

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