

Programme Specification: MSc Artificial Intelligence, Space and Security Technologies

<https://www.bradford.ac.uk/courses/pg/artificial-intelligence-space-security-technologies/>

Entry year: 2026/2027	
Programme property	Details
Level 7 Target award	Master of Science Artificial Intelligence, Space and Security Studies
Level 7 Exit award	Postgraduate Diploma Artificial Intelligence, Space and Security Studies
Level 7 Exit award	Postgraduate Certificate Artificial Intelligence, Space and Security Studies
Target award title	Master of Science Artificial Intelligence, Space and Security Studies
Specified variant(s)	1 year full-time
Admissions	September, City Campus UK Home and International
Degree Awarding Body	The University of Bradford
External Frameworks/ Reference Points	FHEQ Framework for Higher Education Qualifications (2024) Subject Benchmark Engineering (Quality Assurance Agency 2023)
Publication Month and Year	April 2026

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.

If there have been any updates since first publication these are listed here:

1. Jun 26 – New Programme

Programme Aims

Space is one of the UK's fastest growing sectors and a vital part of the UK's economy, with a projected annual income of over £17.5 billion and employing over 48,800 people in diverse roles as scientists, engineers, administrators, analysts, lawyers, project/business managers, sales personnel, entrepreneurs, and innovators in the UK (Source: "Size & Health of the UK Space Industry 2022"). The global space economy is projected to grow to £490 billion by 2030.

Space technology plays a critical role in our daily lives and provides cost-effective and sometimes only means of meeting some of society's biggest challenges. Satellites orbiting at a distance above 160 km from the Earth connect us with our friends, families, and colleagues, facilitate navigation on road, ocean, and air, support homeland security and disaster relief, enable smart and sustainable agriculture, forecast the weather, gather a plethora of vital information about our planet, such as greenhouse gas concentration, melting glaciers and polar ice, deforestation and land use, ocean acidification, coral reef health, and many more.

This MSc course is a well-timed response to the "Space Sector Skills Survey 2023" report commissioned by the UK Space Agency and the Department for Science, Innovation and Technology (DSIT) and published in Sept. 2023. The report identified the growing importance of new skills and technologies such as AI and machine learning (ML) and data-intensive technologies, and highlights a persistent and widening skills gap across the UK space sector.

At the same time, space technologies are increasingly integrated with security infrastructures, autonomous systems, dual-use capabilities, and AI-driven decision-making platforms. This convergence is reshaping national security, defence strategy, critical infrastructure protection, and global governance frameworks. The strategic challenge is therefore no longer solely technical: it also encompasses regulatory, ethical, political, and societal dimensions. As AI-enabled space and security technologies expand, so too does the need for professionals who can navigate questions of accountability, risk, resilience, dual-use governance, and international norms.

This programme addresses a defining challenge of the twenty-first century: the widening gap between rapid advances in space, artificial intelligence and other emerging technologies, and the social, political, and security frameworks that are needed to govern them responsibly. The MSc Artificial Intelligence, Space and Security Studies University of Bradford is designed to equip students with the intellectual depth, practical skills and professional confidence needed to navigate one of the most dynamic and consequential areas of contemporary global affairs.

What makes this programme particularly exciting is the strength and passion of the team behind it. It builds directly on the research strengths of the Bradford–Renduchintala Centre for Space AI and the University of Bradford's established global expertise in peace studies, ethics, and socially responsible science to ensure that technological innovation is understood alongside governance, accountability, and real-world application.

The University of Bradford has a long and established track record in space technology research and training that started in the 1980s. It is a member of the European Space Agency (ESA) funded Satellite Network of Experts (SatNEx) and pioneered and developed the Automated Solar Activity Prediction (ASAP) system for space weather prediction in collaboration with National Aeronautics and Space Administration (NASA) and ESA. The university academic team has strong external grants funding track record from the major space agencies (ESA, UK Space Agency) (UKSA) and funding bodies to work on cutting-edge space technologies projects. The academics also have extensive experience in the design and delivery of successful AI modules, and expertise in RF engineering, antenna design, satellite imaging and remote sensing, modelling and visualisation of space data, satellite integration with terrestrial mobile networks, and other areas of space technology. Students will benefit from state-of-the-art facilities provided

Programme Aims

by the Bradford Renduchintala Centre for Space AI (aka Space Centre) including teaching lab, project lab, satellite monitoring centre, cleanroom, and miniaturised satellite engineering models together with a suite of software platforms and packages. The delivery of this MSc course will also be supported by industry experts, some of whom are members of the Innovation and Skills Advisory Board (ISAB) of the Space Centre.

Students will work in our exceptional learning facilities, benefitting from scholars and practitioners who are not only highly skilled in their respective disciplines, but who are genuinely committed to integrating advanced analytical, space technology and AI related capabilities explicitly within high stakes, conflict affected, and humanitarian contexts.

This programme aims to develop an advanced understanding of these intersecting challenges by integrating advanced technical literacy in space and AI systems with critical understanding of security technologies and the social and political frameworks required to govern them responsibly. The programme is designed to respond directly to identified workforce gaps while preparing graduates to operate at the interface of technological innovation, security strategy, and policy development. In doing so, it aims to enable students to critically analyse technological change within international political, strategic, and institutional contexts, and to equip them with the ability to assess governance, ethical, and legal challenges associated with emerging and dual-use technologies.

The programme further aims to develop the capacity to translate complex technological developments into policy-relevant, operational, and ethically informed analysis, and to foster the integration of social-science perspectives with technological awareness in the analysis of complex global challenges. It prepares graduates for professional roles at the interface of space technologies, artificial intelligence, security strategy and governance. Career pathways include positions within government departments, international organisations, defence and security sectors, space and AI industries, humanitarian agencies, regulatory bodies, and research institutions in roles that can include policy analysis, technology analysis, risk consultancy and many more. Graduates are also well prepared to progress to advanced research in areas including international relations, peace studies, development, and science and technology governance.

Programme Learning Outcomes

Upon successful completion of this programme, graduates will be able to demonstrate achievement of the following learning outcomes:

Programme Learning Outcomes

Subject knowledge and skills

1. Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering.
2. Critically evaluate how emerging technologies, including artificial intelligence, cyber systems, and space infrastructures, shape international security, global power, and patterns of conflict and cooperation
3. Integrate advanced scientific understanding of artificial intelligence enabled, cyber and space systems with social science frameworks to analyse the strategic implications of technological change for international relations, including its impact on deterrence, escalation, and institutional frameworks.
4. Evaluate governance, legal, and ethical responses to dual-use and security-relevant technologies in international and comparative contexts.
5. Demonstrate a critical understanding of how technological systems interact with political, economic, and institutional structures in shaping global security outcomes.

Practical and transferable skills

6. Produce quantitatively informed and policy-relevant analysis that applies mathematical reasoning, data analytics, computational modelling, or systems evaluation to challenges at the intersection of artificial intelligence, space technologies, and international security.
7. Communicate complex interdisciplinary issues effectively to specialist and non-specialist audiences in both written and oral formats
8. Design and complete an original, advanced research project (eg, dissertation) that integrates technical investigation with critical examination of the strategic, legal, ethical and governance dimensions of emerging technologies in international security contexts..

Professional behaviours and qualities

9. Demonstrate the ability to work effectively across disciplinary and professional boundaries, collaborating with technical specialists, policy practitioners, and stakeholders in complex international environments.
10. Apply ethical reasoning and professional responsibility in the assessment and use of emerging technologies, recognising issues of accountability, legitimacy, and risk in real-world decision-making contexts.
11. Exercise informed judgement and decision-making under conditions of uncertainty, complexity, and incomplete information, including the ability to prioritise, evaluate trade-offs, and respond to evolving situations

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.

The MSc pathway is designed for students from STEM and quantitative backgrounds who wish to situate their technical expertise within the broader contexts of international relations, global security, and the governance of emerging technologies. It is particularly suited to graduates in disciplines such as engineering, computer science, physics, mathematics, data science, or related fields who seek to apply their knowledge of artificial intelligence, space systems, and security technologies to policy, regulatory, and strategic challenges.

Applicants may include early-career professionals and career changers aiming to work in international organisations, government, NGOs, or technology governance roles.

The **minimum entry requirements** for this programme are:

A 2:2 or better UK Honours degree or equivalent in a Science, Technology, Engineering, Mathematics, or other discipline with a quantitative element such as Geography, Statistics, and Psychology from an approved degree-awarding body.

English language requirements: IELTS with 6.0 overall, no sub-test less than 5.5.

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 page: **<https://www.bradford.ac.uk/courses/pg/artificial-intelligence-space-security-technologies/>**

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 you accept an offer of a place on a programme of study at the University of Bradford. View our Student Contract for further details: **<https://www.bradford.ac.uk/student-contract/>**

Artificial Intelligence, Space and Security Technologies is a postgraduate Master of Science programme. Students will aim to complete the course in one year of study. At Bradford, the year is split in three parts. Students study taught modules of academic taught content in Semester 1 and Semester 2, followed by a dissertation research stage.

From the moment students join our programme, they are welcomed into a supportive, inclusive and intellectually stimulating academic community. We recognise and celebrate the diversity of our cohort and draw upon students varied prior experiences, disciplinary backgrounds, professional knowledge and cultural perspectives.

Our induction process establishes from the beginning that accessing help and support is a normal and positive part of academic development. Students are introduced to the wide range of support available across the University, including academic skills development, library services, career development and wellbeing services. Each student is allocated a Personal Academic Tutor who provides consistent academic guidance throughout the course. This sustained relationship ensures that students feel supported as individuals and are able to navigate the programme with confidence.

Taught Elements of the Programme

In the first semester, students develop a foundational understanding of the relationship between technological change and global security. The focus is on how artificial intelligence, cyber systems, and space infrastructures are reshaping international relations, strategic competition, and the structure of global order. Core modules introduce key concepts in the space ecosystem and its various enabling technologies to understand key elements of satellite systems architectures, spacecraft capabilities, performance and behaviour with an emphasis on how space projects have improved the quality of life. Simultaneously students examine the transformation of global security structures through advances in military technology. It situates technological developments within broader theoretical and strategic debates in international relations and security studies. Optional modules allow students to begin tailoring their studies towards particular areas of interest.

In the second semester, the focus shifts towards the governance, regulation, and ethical implications of emerging technologies. Students examine how states, international organisations, and other actors attempt to manage high-risk and dual-use technologies under conditions of uncertainty, competition, and institutional constraint. Teaching emphasises the evaluation of governance frameworks, ethical reasoning, and the use of anticipatory tools such as scenario planning, horizon scanning, and risk assessment.

Research Elements of the Programme

Alongside the taught elements of the programme, students undertake a 60-credit dissertation. Students are expected to formulate a clear research question, apply appropriate theoretical and analytical frameworks, engage with relevant academic and policy literature, and produce a sustained and coherent piece of independent work. The dissertation represents the culmination of the programme, demonstrating the ability to integrate and apply their knowledge to a research-driven or industry-oriented challenge at the intersections of artificial intelligence, space and security technologies.

Each student is allocated a dissertation supervisor who provides sustained, tutorial-style guidance through the research process. The dissertation is carefully scaffolded into manageable stages, with structured milestones and ongoing feedback loops to support steady progress.

Student journey

Graduation and next steps

It prepares graduates for professional roles at the interface of space technologies, artificial intelligence, security strategy and governance. Career pathways include positions within government departments, international organisations, defence and security sectors, space and AI industries, humanitarian agencies, regulatory bodies, and research institutions in roles that can include policy analysis, technology analysis, risk consultancy and many more. Graduates are also well prepared to progress to advanced research in areas including international relations, peace studies, development, and science and technology governance.

Module List: Students select one optional in Semester 1 and one option in Semester 2

Period	Type	Module Title	Credit	Level	Code
Sem 1	Core	Space Ecosystem and Enabling Technologies	20	7	ELE7041-B
Sem 1	Core	Technology, Power, and Global Security Order	20	7	PES7080-B
Sem 1	Optional	Statistical Applications of Industrial Big Data	20	7	COS7049-B
Sem 1	Optional	Big Data Visualisation	20	7	COS7046-B
Sem 2	Core	Applied AI in Space Data and Systems	20	7	ELE7042-B
Sem 2	Core	Governance, Ethics, and Future of Science and Technology	20	7	PES7081-B
Sem 2	Optional	Earth Observation Satellite Systems	20	7	ELE7036-B
Sem 2	Optional	Technology, Violence, and Crisis	20	7	PES7082-B
FLYR	Core	MSc Project	60	7	ENG7002-E

Learning, teaching and assessment strategy

Themes and considerations

The programme is interdisciplinary, research-led, and integrates advanced technical knowledge of artificial intelligence, space systems, and security technologies with international relations and global security studies. It combines scientific and quantitative methods such as data analytics, computational modelling, and systems evaluation with critical analysis of governance, risk, and regulatory frameworks.

The MSc is designed to equip students to understand not only how AI-enabled and space-based technologies function, but also how they reshape global security architectures, strategic competition, critical infrastructure resilience, and international governance. Through the integration of technical expertise with policy and strategic analysis, the programme prepares graduates to operate confidently at the interface of technological innovation and international security decision-making.

The programme places particular emphasis on high-stakes and uncertain environments, including conflict-affected and technologically accelerated contexts, where decision-making must account for risk, ambiguity, and unintended consequences.

Teaching is therefore oriented towards developing the ability to interpret complex technological developments, assess their strategic and societal implications, and translate analysis into policy-relevant responses.

The programme is particularly attentive to the challenges of bridging technical and non-technical expertise, ensuring that students can engage confidently with specialists while maintaining a critical, policy-oriented perspective.

Programme teaching and learning

Teaching is delivered through a structured combination of interactive taught sessions, using applied exercises designed to integrate international relations analysis with quantitative and qualitative technological understanding. The programme adopts a seminar-led and research-informed approach, encouraging active participation, critical discussion, and engagement with both academic and policy debates, applying these concepts to real world issues.

Students will acquire employable knowledge of a broad range of space technologies as well as industry-ready skills to use data analytics, cybersecurity, and AI tools for space applications, and develop skills in the use of specialist software and simulation packages.

Core modules provide a progressive learning structure. In Semester 1, teaching focuses on developing conceptual and analytical foundations, including international security theory, strategic analysis, and qualitative understanding of artificial intelligence, cyber systems, and space technologies. This establishes the basis for informed engagement with technological issues without requiring prior technical training. In Semester 2, teaching shifts towards governance, ethics, and policy application. Students engage with legal, normative, and institutional frameworks, and develop the ability to analyse and design policy responses to emerging technological risks. Teaching at this stage incorporates applied policy exercises, including scenario-based analysis, risk assessment, and structured problem-solving tasks.

Across the programme, learning is supported through the use of case studies, simulations, and real-world examples, such as the role of AI in security decision-making, cyber conflict, and the militarisation of space. These approaches are designed to bridge theory and practice, enabling students to translate conceptual understanding into applied analysis. Interdisciplinary teaching draws on expertise from international relations, peace studies, ethics, and engineering, ensuring that students develop the ability to engage critically with both technical and policy perspectives.

The programme is designed for an international and diverse cohort and incorporates inclusive and participatory teaching approaches that support different disciplinary backgrounds and learning styles. It emphasises critical thinking, ethical awareness, and real-world application, preparing students to operate effectively in professional environments that require collaboration across technical, policy, and organisational boundaries. To reflect our diverse student population and to accommodate differences in learning preferences, asynchronous online activities and resources are also provided to enable our students to work through any key concepts at their own pace and in their own time. Digital content will be created in a way that is accessible to all. Students are signposted to required learning before each taught session, which might be required reading or watching of online content, and the classroom time can then focus on exploring that in more depth.

Independent study is a core component of the programme, culminating in the dissertation, where students apply their knowledge and skills to an original research problem in international relations and emerging technologies.

We have an internationally renowned, research-active teaching team who provide our students with cutting-edge, inspirational research through a variety of interactive and research informed teaching methods. This engages and enthuses our students and provides further opportunities for those students wishing to pursue a research career pathway. Our research engaged approach builds our students' confidence in how they understand and use research whilst contextualising this to real world case studies.

Learning, teaching and assessment strategy

Programme assessment

Assessment on the programme is designed to reflect its interdisciplinary and applied focus. It evaluates students' ability to integrate artificial intelligence and space technologies with informed understanding of international relations, and to translate this into clear, evidence-based, and policy-relevant outputs.

A range of assessment formats is employed across modules, including analytical essays, laboratory reports, policy briefs, applied reports, presentations, and other forms of written and oral assessment. These formats are selected to reflect the types of analytical and communication tasks undertaken in professional environments such as government, international organisations, NGOs, and consultancy. Across the programme, assessment supports the development of key skills, including critical analysis of technology-driven security challenges, evaluation of governance and ethical frameworks, and the ability to produce concise and actionable policy-relevant recommendations. These assessments evaluate both subject-specific knowledge and transferable skills, equipping students with a competitive edge upon graduation.

While individual modules have distinct assessment patterns, the overall design ensures that students engage with both conceptual analysis and applied problem-solving. Formative assessment and regular feedback opportunities are embedded throughout the programme to support learning and progression. This includes seminar discussions, short written exercises, draft submissions, quizzes, presentations, practical exercises and feedback on assessment planning. These activities help students maximise their learning and prepare for summative assessments.

Assessments in the programme follow the University of Bradford AI principles. Some assessments will specifically require students to demonstrate their ability to apply AI in space data and systems analysis, design, and operations. However, final assessments focus on students' individual approaches, critical evaluations, and reasoning processes to ensure academic integrity and independent thinking.

The dissertation represents the culmination of the programme. It requires students to design and execute an independent research project with a significant engineering content addressing a substantive question in artificial intelligence, space and security technologies. The dissertation assesses the ability to integrate theoretical knowledge, empirical analysis, and critical judgement in a sustained and coherent piece of work.

Overall, the assessment strategy ensures progressive development from analytical understanding to applied and independent research, while maintaining flexibility across modules and supporting a diverse range of student backgrounds and career pathways.

Programme regulations

This programme follows the Assessment, Continuation and Award regulations for undergraduate taught courses published on the University's Website (**Regulation 9**).