Course Specification

Course Summary Information		
1	**Course Title**	BSc (Hons) Artificial Intelligence (with Foundation Year)
2	**Course Code**	US1539F
3	**Awarding Institution**	Birmingham City University
4	**Teaching Institution(s)** (if different from point 3)	
5	**Professional Statutory or Regulatory Body (PSRB) accreditation** (if applicable)	

6	**Course Description**
	Developing skills in artificial intelligence is one of the biggest challenges facing industries both globally and nationally today. This BSc Artificial Intelligence degree is designed to tackle industry demands and equip you with cutting-edge skills in deep learning, natural language processing, computer vision, cloud computing, and Generative AI. These capabilities will enable you to deliver intelligent software solutions that power innovation across the modern economy and contribute towards the future of society. You will graduate prepared for careers like Artificial Intelligence Engineer, Machine Learning Specialist, Data Scientist, and Natural Language Processing Developer. The Foundation Year course option enables you to study for our BSc (Hons) degree over an extended full-time duration of four years by including a Foundation Certificate (year one of four). The Foundation Certificate provides a broad study programme that underpins the follow-on degree. In order to progress to the next year of your degree, it is necessary to achieve a pass in all of the modules of the Foundation Certificate. **What's covered in the course?** Throughout the course, you will have opportunities to interact with a curriculum that is supported by commercial and industrial content and partners. In your second year, modules at the start of the course are mostly common with other Computing and AI courses to ensure a strong technical foundation in the field. You will develop an understanding of programming, algorithms and data structure, computer systems, and web development, while also being introduced to artificial intelligence, and innovation through dedicated projects. In your third year, you'll study specialised modules in artificial intelligence and machine learning, natural language processing, computer vision, and software deployment using machine learning operations. You'll also gain solid experience in backend development, object-oriented programming, and database engineering, enabling you to build and train intelligent systems. In your final year, you will explore advanced AI technologies such as deep neural networks, generative AI, cloud computing, deep neural networks and ethics, and modern data storage systems - as well as ethical and societal implications of AI solutions. A major highlight of your final year is the individual project, where you'll tackle a real-world AI problem, applying your knowledge

	to research, design, implement, and evaluate a comprehensive solution. This capstone project helps prepare you for professional roles and demonstrates your capabilities to future employers. Additionally, you will have the opportunity to take a professional placement year between your second and third year, which we highly recommend, as it will give you an invaluable opportunity to hone your expertise, try out a potential career path and get relevant workplace experience that is valued by many employers, boosting your CV.		
7	**Course Awards**		
7a	**Name of Final Award**	**Level**	**Credits Awarded**
	Bachelor of Science with Honours Artificial Intelligence	6	480
7b	**Exit Awards and Credits Awarded**		
	Foundation Certificate Computing	3	120
	Certificate of Higher Education Computer Science	4	240
	Diploma of Higher Education Computer Science with Machine Learning	5	360
	Bachelor of Science Artificial Intelligence	6	420

8	**Variations from the University Academic Regulations**
	Not applicable

9	**Delivery Patterns**			
Mode(s) of Study		**Location(s) of Study**	**Duration of Study**	**Code(s)**
Full Time		City Centre	3 years	US1539
Full Time with Foundation Year		City Centre	4 years	US1539F

10	**Entry Requirements**	
	Home:	The admission requirements for this course are stated on the course page of the BCU website at https://www.bcu.ac.uk/.
	EU:	
	International:	
	Access:	

11	Course Aims

Artificial Intelligence (AI) continues to revolutionise industries worldwide with high-impact applications in business, science, healthcare, and creative technologies. As AI and Data have been identified as one of the four grand challenges in the UK government's industrial strategy, the **BSc Artificial Intelligence** at Birmingham City University directly addresses this national priority and the global demand for skilled AI professionals.

This course is purpose-built to produce graduates with deep, applied knowledge of AI techniques including **machine learning**, **deep learning**, **natural language processing (NLP)**, **computer vision**, and **generative AI (GenAI)**. You will also gain hands-on experience in data integration, big data platforms, and scalable deployment using **machine learning operations (MLOps)** preparing you to build intelligent systems that solve real-world problems across sectors.

Industry Demand and Career Opportunities

AI is one of the fastest-growing career fields globally, with UK job postings related to artificial intelligence rising significantly in recent years. Employers across sectors — from healthcare and finance to autonomous vehicles and entertainment — seek professionals skilled in AI development and deployment. Salaries and progression opportunities in this field reflect its strategic importance and skills scarcity.

Birmingham City University has already established national leadership in AI education through the award-winning **£1.7M RAISE Project**, delivering the popular MSc Artificial Intelligence programme. The **BSc Artificial Intelligence** builds on this success, serving as a foundation for both immediate employment and progression to postgraduate study in AI or Big Data.

Key Skills and Technologies

As a graduate of this programme, you will be equipped with a future-facing skill set in:

- **Machine Learning and Deep Neural Networks**: for problem solving, pattern recognition, and decision-making
- **Computer Vision**: enabling systems to interpret and act on visual data from the world around them
- **Natural Language Processing (NLP):** powering applications in translation, summarisation, sentiment analysis, and AI chatbots
- **Generative AI (GenAI)**: creating new data, images, code, or content using models like GANs and large language models (LLMs)
- **Data Management and MLOps**: ensuring scalable and production-ready AI solutions in real-world systems
- **Modern Data Stores and Big Data Frameworks**: working with complex datasets across distributed systems
- **SQL and Backend Development**: managing, integrating, and querying structured and unstructured data
- **Cloud Computing and Deployment Pipelines**: delivering AI systems via cloud-native solutions and APIs
- You'll also explore the **ethical, societal, and legal** dimensions of AI systems, preparing you to design responsible and human-centric solutions. Through team projects, live briefs, and a final-year individual project, you'll develop the practical and collaborative skills that employers value.

12	Course Learning Outcomes
	Knowledge and Understanding
1	Demonstrate systematic understanding of essential facts, concepts, theories and principles of artificial intelligence.
2	Be able to evaluate and analyse contemporary tools and technologies to compose solutions relevant to the domain of artificial intelligence to meet a set of agreed requirements.
3	Understand the roles and responsibilities of a professional working within a data/modelling role.
4	Appreciate the social, environmental, ethical, economic and commercial considerations that impact on artificial intelligence solutions.
	Skills and other attributes
5	Critically appraise theories and effectively deploy a range of techniques and tools for the modelling, design and implementation of artificial intelligence systems for the purposes of comprehension, problem solving, prediction and the understanding of trade-offs.
6	Specify the requirements and practical constraints of artificial intelligence solutions considering a wide range of aspects.
7	Formulate strategies for data management problems and their future developments using modern research.
8	Effectively communicate information and ideas concerning problems and solutions in the field of artificial intelligence.
9	Work effectively as a member of a team, and undertake management and planning activities, recognising the different roles within a team and different ways of organising teams.
10	Leverage Generative AI solutions and NLP techniques to design and create content in line with organisational requirements.

13	Level Learning Outcomes
	Upon completion of Level 4 / the Certificate of Higher Education, students will be able to:
1	Demonstrate an appreciation of essential facts, concepts and principles of artificial intelligence.
2	Be able to compare popular tools and technologies to propose solutions relevant to the domain of artificial intelligence.
3	Differentiate between the roles and responsibilities of a professional working within a technical role.
4	Appreciate the social, environmental and ethical considerations that have an impact on artificial intelligence solutions
5	Examine theories and tools for the modelling, design and implementation of artificial intelligence systems for the purposes of problem-solving.
6	Suggest requirements and practical constraints of artificial intelligence solutions considering common industrial limitations.
7	Communicate information and ideas concerning problems and solutions in the field of artificial intelligence.
8	Work effectively as a member of a team, and undertake management and planning activities, recognising the different roles within a team and different ways of organising teams.

	Upon completion of Level 5 / the Diploma of Higher Education, students will be able to:
1	Argue specifics of essential facts, concepts and general theories of artificial intelligence.
2	Be able to appraise common tools and technologies to compose solutions relevant to the domain of artificial intelligence to meet a set of agreed requirements.
3	Compare the roles and responsibilities of a professional working within a machine learning role.
4	Evaluate the limitations and ethical considerations of AI applications, including bias, data privacy, and model explainability.
5	Recommend a complete machine learning solution by identifying a real-world problem, sourcing data, formulating a research question, and developing a functional analytics pipeline.
6	Specify the requirements and practical constraints of common artificial intelligence solutions considering a range of aspects.
7	Design strategies for data management problems cognisant of user access requirements.
8	Communicate information and ideas concerning problems and justifying solutions in the field of artificial intelligence.
9	Work effectively as a member of a team recognising the different roles within a team and different ways of organising teams.
10	Implement simple Generative AI solutions to create basic image and text content.
	Upon completion of 60 credits at Level 6 / the Bachelor's Degree, students will be able to:
1	Demonstrate a systematic understanding of essential facts, concepts, theories and principles of artificial intelligence.
2	Be able to evaluate and contrast contemporary tools and technologies to compose solutions relevant to the domain of artificial intelligence to meet a set of agreed requirements.
3	Understand the roles and responsibilities of a professional working within a data/modelling role.
4	Formulate social, environmental, ethical, economic and commercial considerations that impact on artificial intelligence solutions.
5	Critically appraise theories and effectively deploy a range of techniques and tools for the modelling, design and implementation of artificial intelligence systems for the purposes of comprehension, problem solving, prediction and the understanding of trade-offs.
6	Compose specific requirements and practical constraints of artificial intelligence solutions considering a wide range of aspects.
7	Formulate strategies for data management problems and their future developments using modern research.
8	Effectively communicate information, hypotheses and strategies for practical solutions in the field of artificial intelligence.
9	Work effectively as a member of a team, and undertake management and planning activities, recognising the different roles within a team and different ways of organising teams.
10	Leverage Generative AI solutions to design and create content in line with organisational requirements.

14	**Course Learning, Teaching and Assessment Strategy**
	Teaching focuses on application-oriented problem-solving in artificial intelligence (AI) so that the relevance for you as a learner is clear. Modules use real-world examples to justify what, and how, tools and techniques are taught. Each level of study reinforces the skills and knowledge gained earlier to develop you as an increasingly independent learner who can investigate theory and practice to synthesise innovative AI solutions. The modules are taught in a research informed fashion but with modern industrial tools; in several modules the content is also aligned with industrial badges. Therefore, you consistently enhance your technical abilities and understanding by analysing and examining theory, evaluating alternative solutions and thereby constructing practical implementations that fuel business and modern living. Hence, the course produces highly employable graduates, who can formulate principled solutions for the technology driven economy and design artefacts to realise those solutions. Across the breadth of modules, you experience flipped learning, group tasks and peer review, as well as exposure to industry-standard development paradigms in laboratory sessions. Via practices such as; encouraging you to investigate problem sets of your own choice or inviting you to research on a topic from a selection of given choices the teaching practice cultivates an independent learning mindset that is nurtured further across higher levels. For each module, an assessment brief details the requirements to achieve a particular grade/mark against each grading criterion. These breakdowns or differentiated descriptors articulate how the level of achievement will be marked. Formative evaluation is a consistent theme where you are required to complete various in-class or in-lab tasks that are graded either automatically or solutions are provided to them. Teaching sessions also consistently highlight how learning across the semester culminates into summative deliverables. Each module also supports the submission of assessments via dedicated sessions either during normal teaching weeks or in the assessment weeks. For some modules with large student numbers, workshop style support sessions are arranged in summer to help the students resit the module. As part of the school's *Reimagining the* Curriculum initiative, multiple modules across various levels align their assessment tasks so you can assess the impact of different (and increasingly sophisticated) methods taught across levels on the same task. This helps you benchmark the technology taught across various levels and critically appraise the role of technological diversity and development stack along the business verticals. To evaluate the societal impact of modern technology and to reflect the University's commitment to a sustainable and resilient future, consistent attention is paid to non-technical issues such as the commercial impact, ethics, data protection, and sustainability as per the UN's Sustainable Development Goals, which are assessed across different modules.

15	Course Requirements

15a

Level 3:

In order to complete this course a student must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value
CMP3010	Fundamental Mathematics	20
CMP3014	Fundamentals of Digital Technology	20
CMP3012	Web Application Design	20
CMP3016	Emerging Technologies	20
CMP3015	Independent Practice	20
CMP3009	Foundations of Programming	20

Level 4:

In order to complete this course a student must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value
CMP4267	Computer Systems	20
CMP4312	Mathematics for AI	20
CMP4272	Data Structures & Algorithms	20
CMP4285	Innovation Project	20
CMP4266	Computer Programming	20
CMP4294	Introduction to Artificial Intelligence	20

Level 5:

In order to complete this course a student must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value
CMP5332	Object Oriented Programming	20
CMP5398	Computer Vision	20
CMP5367	Artificial Intelligence and Machine Learning	20
CMP5387	Backend Web-services Development and Database Engineering	20
CMP5399	Natural Language Processing	20
CMP5366	Data Management and Machine Learning Operations	20

Level 6:

In order to complete this course a student must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value
CMP6228	Deep Neural Networks and Ethics	20
CMP6207	Modern Data Stores and Data Protection	20
CMP6252	Generative AI	20
CMP6210	Cloud Computing	20
CMP6200	Individual Honours Project	40

15b Structure Diagram

Level 3

SEMESTER ONE	SEMESTER TWO
Core	**Core**
CMP3010 Fundamental Mathematics	CMP3016 Emerging Technologies
CMP3014 Fundamentals of Digital Technology	CMP3015 Independent Practice
CMP3012 Web Application Design	CMP3009 Foundations of Programming

Level 4

SEMESTER ONE	SEMESTER TWO
Core	**Core**
CMP4266 Computer Programming (20 Credits)	CMP4272 Data Structure and Algorithms (20 Credits)
CMP4267 Computer Systems (20 Credits)	CMP4294 Introduction to Artificial Intelligence (20 Credits)
CMP4312 Mathematics for AI (20 Credits)	CMP4285 Innovation Project (20 Credits)

Level 5

Core CMP5332 Object Oriented Programming (20 Credits) CMP5387 Backend Web-services Development and Database Engineering (20 Credits) CMP5367 Artificial Intelligence and Machine Learning (20 Credits)	**Core** CMP5398 Computer Vision (20 Credits) CMP5366 Data Management and Machine Learning Operations (20 Credits) CMP5399 Natural Language Processing (20 credits)

Level 6

Core CMP6207 Modern Data Stores and Data Protection (20 Credits) CMP6228 Deep Neural Networks and Ethics (20 Credits)	**Core** CMP6252 Generative AI (20 credits) CMP6210 Cloud Computing (20 credits)
Core Individual Honours Project (40 Credits)	

16 Overall Student Workload and Balance of Assessment

Overall student *workload* consists of class contact hours, independent learning and assessment activity, with each credit taken equating to a total study time of around 10 hours. While actual contact hours may depend on the optional modules selected, the following information gives an indication of how much time students will need to allocate to different activities at each level of the course.

- *Scheduled Learning* includes lectures, practical classes and workshops, contact time specified in timetable
- *Directed Learning* includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning
- *Private Study* includes preparation for exams

The *balance of assessment* by mode of assessment (e.g. coursework, exam and in-person) depends to some extent on the optional modules chosen by students. The approximate percentage of the course assessed by coursework, exam and in-person is shown below.

Level 3

Workload
24% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	288
Directed Learning	498
Private Study	414
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	100%
Exam	0
In-Person	0%

Level 4

Workload
24% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	288
Directed Learning	468
Private Study	444
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	70%
Exam	12%
In-Person	18%

Level 5

Workload
24% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	288
Directed Learning	473
Private Study	439
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	82%
Exam	0%
In-Person	18%

Level 6

Workload
17% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	202
Directed Learning	258
Private Study	740
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	84%
Exam	0%
In-Person	16%