Course Specification

Course Summary Information		
1	**Course Title**	MSc Artificial Intelligence
2	**Course Code**	PT1415
3	**Awarding Institution**	Birmingham City University
4	**Teaching Institution(s)** (if different from point 3)	N/A
5	**Professional Statutory or Regulatory Body (PSRB) accreditation** (if applicable)	N/A

6	**Course Description**
	This course will equip you with a sound understanding of the theory and practice of applied Artificial Intelligence (AI) systems through pathways. Streams include core AI and Fintech pathways which have been designed to meet industry needs. As a computing conversion course, it is assumed that you are starting fresh with no experience of computer programming and little experience of using mathematics or statistics in your undergraduate courses or in work. The course begins by creating a foundation in programming and mathematics, upon which you will build the expertise in several key areas of AI oriented to the pathway, going from first Python code and basic algebra, right through to computer vision. The core applied areas of the MSc AI include: • Image Analysis - machine learning has shown incredible results recently in understanding the themes of images and video which are being applied in a range of commercial settings; from security and driverless cars to online clothes shopping. • Natural Language Processing - being able to understand speech and text is one of the cornerstones of AI systems. Chatbots built on AI are appearing all over the internet, but more than this, technology giants are searching for ways that machines can have detailed conversations with one another and read and understand text documents. • Time Series - dealing with dynamic data is vital to AI systems in finance, healthcare and defence; whether predicting system vulnerabilities, future stock prices or even predicting patient outcomes in ICU, and how a virus outbreak will permeate through a population. The Fintech pathway complements learners with a finance background by applying AI techniques to risk management and portfolio analysis, giving graduates a competitive edge in the field. Core AI pathway learners will cover data visualisation with editorial design and AI pipelines and impact evaluation. A strong focus on technology monitoring and ethics will be taught in a way to suit learners from all backgrounds; rather than through specific case studies which only suit certain types of learners. Ethics and horizon scanning frameworks are introduced to apply to any industry. The

	master's project will have an industrial route, should you wish to work on an applied project with a corporate partner, and there will be a route on graduation to undertake a professional placement or go on to a doctoral research programme.

7	Course Awards		
7a	**Name of Final Award**	**Level**	**Credits Awarded**
	Master of Science Artificial Intelligence Master of Science Artificial Intelligence with Professional Placement	7 7	180 240
7b	**Exit Awards and Credits Awarded**		
	Postgraduate Certificate Data Analytics	7	60
	Postgraduate Diploma Artificial Intelligence	7	120

8	Variations from the University Academic Regulations
	N/A

9	Delivery Patterns			
Mode(s) of Study		**Location(s) of Study**	**Duration of Study**	**Code(s)**
Full Time		City Centre	1 year	PT1415
Full Time with Professional Placement		City Centre	16 months	PT1417

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

11	Course Aims
	The course aims to generate graduates capable of solving data-oriented challenges encountered by organisations in a range of diverse fields. Such challenges include image, text and learning tasks in domains of finance, healthcare and technology.

12	Course Learning Outcomes
	Knowledge and Understanding
1	Critically analyse key concepts, theories, approaches, techniques, and principles related to the design and development of Artificial Intelligence systems.
2	Identify and justify the use of different evaluation and analytical approaches to determine the effectiveness of a variety of data modelling practices.

3	Assess emerging trends in the field of artificial intelligence and consider their potential for organisational and societal impact.
4	Examine and appraise key ethical, social, and commercial considerations around the design of Artificial Intelligence systems.
5	Understand and interpret the roles and responsibilities of a professional working in the Artificial Intelligence, Data Science and applied professions.
	Skills and Other Attributes
6	Design and create interactive solutions to real-world problems through applying industry standard principles across a range of platforms and technologies.
7	Critically assess the effectiveness of development libraries, platforms, and frameworks commonly used for building data-driven models.
8	Process, interpret, and analyse complex data (utilising multiple techniques) to evaluate the effectiveness of machine learning models and to construct data-driven decisions for future iterative work.
9	Work across disciplines to create data-driven intelligent solutions to real-world problems both individually and as part of a group; managing project activities under time pressure.
10	Communicate complex concepts effectively in oral presentations, interactive demonstrations, and written reports through appropriately tailoring descriptions for different target audiences.

13	**Level Learning Outcomes** ***These are what you are expected to be able to achieve after completing each level (or exit award, see section 7) of your master's degree. The numbers in the left column refer to the course learning outcomes in section 12.***
	Upon completion of the PG Cert Data Analytics award, you will be able to meet the following learning outcomes:
2	Identify and justify the use of different evaluation and analytical approaches to determine the effectiveness of a variety of data modelling practices.
5	Understand and interpret the roles and responsibilities of a professional working in the Artificial Intelligence, Data Science and applied professions.
7	Critically assess the effectiveness of development libraries, platforms, and frameworks commonly used for building data-driven models.
10	Communicate complex concepts effectively in oral presentations, interactive demonstrations, and written reports through appropriately tailoring descriptions for different target audiences.
	Upon completion of the PG Dip Artificial Intelligence award, you will meet all of the above learning outcomes and:
1	Critically analyse key concepts, theories, approaches, techniques, and principles related to the design and development of Artificial Intelligence systems.
3	Assess emerging trends in the field of artificial intelligence and consider their potential for organisational and societal impact.
4	Examine and appraise key ethical, social, and commercial considerations around the design of Artificial Intelligence systems.

	Upon completion of the MSc Artificial Intelligence award, you will be able to meet all of the above learning outcomes and:
6	Design and create interactive solutions to real-world problems through applying industry standard principles across a range of platforms and technologies.
8	Process, interpret, and analyse complex data (utilising multiple techniques) to evaluate the effectiveness of machine learning models and to construct data-driven decisions for future iterative work.
9	Work across disciplines to create data-driven intelligent solutions to real-world problems both individually and as part of a group; managing project activities under time pressure.

14	**Course Learning, Teaching and Assessment Strategy**
	The course has been designed to support the transition of diverse groups; including female, black and disabled learners; into the field of technology. As such, a block delivery with a progressive learning methodology has been adopted with modules delivered in 4-week sprint cycles and 2-day on-campus delivery to suit a range of life circumstances such as caring responsibilities or employment. Case studies have been sourced from a variety of application domains to ensure they are relevant to the diverse cohort. To ensure industry-relevance, the assessment diet is varied including; - User blogs - Group presentations and peer critique - Prediction Competitions - Group Debate - Technical Report and Analysis A significant proportion of learners have engaged in industrial extra-curricular projects gaining invaluable professional experience as well as appreciating the AI pipeline and common data challenges.

15	**Course Requirements**

15a Level 7

In order to complete the Master of Science Artificial Intelligence, you must successfully complete all the following CORE modules (totalling 140 credits):

Module Code	Module Name	Credit Value
CMP6221	Computing for AI	20
CMP7228	Machine Learning	20
CMP7251	Generative AI for NLP	20
CMP7252	Computer Vision	20
CMP7200	Individual Masters Project	60

In addition, you must choose either to study the AI Pathway or the Fintech Pathway and successfully complete 20 credits from the following PATHWAY modules per semester:

Module Code	Module Name	Credit Value
CMP7227 FIN7TBC	Semester 1 Modules: Data Visualisation (AI Pathway) Risk Management in Fintech (Fintech Pathway)	20
CMP7226 FIN7TBC	Semester 2 Modules: Impact of AI (AI Pathway) Portfolio Analysis (Fintech Pathway)	20

In order to complete the Master of Science Artificial Intelligence with Professional Placement, you must successfully complete all the following CORE modules (totalling 200 credits), and choose one of the pathways listed above (totalling 40 credits):

Module Code	Module Name	Credit Value
CMP6221	Computing for AI	20
CMP7228	Machine Learning	20
CMP7251	Generative AI for NLP	20
CMP7252	Computer Vision	20
CMP7200	Individual Masters Project	60
PLA6004	Professional Placement	60

15b	Structure Diagram

Level 7 – Full Time

SEMESTER 1	SEMESTER 2	SEMESTER 3
CORE: Computing for AI (20 credits) CORE: Machine Learning (20 credits)	CORE: Generative AI for NLP (20 credits) CORE: Computer Vision (20 credits)	Individual Master's Project (60 credits)
AI Pathway		
Data Visualisation (20 credits)	Impact of AI (20 credits)	
Fintech Pathway		
Risk Management in Fintech (20 credits)	Portfolio Analysis (20 credits)	

Level 7 – Full Time with Professional Placement

Year 1 - SEMESTER 1	Year 1 - SEMESTER 2	Year 1 – SEMESTER 3
CORE: Computing for AI (20 credits) CORE: Machine Learning (20 credits)	CORE: Generative AI for NLP (20 credits) CORE: Computer Vision (20 credits)	Individual Master's Project (60 credits)
AI Pathway		
Data Visualisation (20 credits)	Impact of AI (20 credits)	
Fintech Pathway		
Risk Management in Fintech (20 credits)	Portfolio Analysis (20 credits)	
Year 2 - SEMESTER 1	**Year 2 - SEMESTER 2**	**Year 2 – SEMESTER 3**
Professional Placement (60 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.

Workload

Percentage of time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	360 (20%)
Directed Learning	612 (34%)
Private Study	828 (46%)
Total Hours	1,800

Balance of Assessment

Assessment Mode	AI Pathway	Fintech Pathway
Coursework	92%	92%
Exam	0%	8%
In-Person	8%	0%