

## Course Specification

Course Summary Information			
1	Course Title		BSc (Hons) Computer and Data Science with Foundation Year
2	Course Code	UCAS Code	US0922F I10F
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
	<p>Do you want to develop the skills needed to be a leading computing professional for the 21<sup>st</sup> century? Skills development in Data Science and Artificial Intelligence tops the <a href="#">list of four grand challenges</a> facing the British industry as per the Industrial Strategy of the government. To respond to this national call - inspired by a global demand for these skills - BSc Computer and Data Science produces Computer Science graduates who specialise in the most modern methods on Artificial Intelligence, Machine Learning, Deep Learning, Data Visualisation and a wide range of tools for evaluating, storing, integrating and processing data to deliver high-value software solutions to the challenges faced by the modern economy.</p> <p>Also, to give you a solid foundation in Computer Science, this course shares a common first year with the Computer Science programme, and teaches computer programming, computer architecture, algorithms and data structures, network fundamentals and website design, all the while nurturing your creativity. In the second and third year the course continues to teach vital topics from Computer Science such as software engineering, cyber security and databases.</p> <p>As a result you can apply for job titles including the terms Computer Science, Software Engineer, Software Developer, Data Scientist, Machine Learning Engineer, and Artificial Intelligence.</p> <p>You'll gain a well-rounded education in Computer and Data Science, whilst developing your teamwork and software development skills. This is because you will work collaboratively with academics and businesses, applying practice-based skills to real-life case studies and projects.</p> <p>While studying your Computer and Data Science degree with us, you'll also have access to dedicated industry-standard facilities in a fully equipped lab running the latest software. Plus, we're home to a Cisco Systems and a Microsoft Academy Centre, so you can rest assured knowing our university course will prepare you for a successful career in the industry.</p> <p><b>About the Foundation Year</b></p> <p>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</p>

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?**

In your first year you will share a common first year with the BSc Computer Science course. The first year covers fundamental concepts, such as computer programming, algorithms and data structures, computer systems, website development, and network fundamentals while also nurturing your creativity with an innovation project.

In your second year, you will consolidate your learning by studying four Computer Science modules and two Data Science specific modules. The Computer Science modules include advanced topics, that is, cyber security and software design, as well as critical topics, that is, object oriented programming and database & web application development. The Data Science modules are Introduction to Data Science and Data Visualisation that introduce the lifecycle and visualisation of a data oriented project/product.

In the final year you will broaden your understanding of data science by studying specialised subjects like artificial intelligence and machine learning, modern data stores, deep neural networks and, data management and machine learning operations.

In addition, you will complete an individual project in order to demonstrate your technical skills and general employability in preparation for career progression. The individual project simulates typical graduate workplace tasks that require in-depth knowledge and skills in a specific area of computer and data science. This will include consideration of wider issues and the ability to manage activities and resources, and to generate, implement and report on solutions to meet task objectives.

During your course, you'll have the opportunity to take a professional placement year between your second and third year. This is something we recommend highly, 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. It will also boost your CV.

Throughout your studies, you'll be supported by our expert teaching staff, all of whom have a wide range of research and industrial experience in areas such as computer security and software engineering, which they use to enhance the curriculum.

We will help you to develop a good balance between in-depth academic knowledge and technical and practical expertise, equipping you with a range of transferable skills, such as complex problem-solving, the ability to analyse in a careful and considered manner, and working as a team member.

You'll be based at our flagship City Centre Campus, where you'll use dedicated, industry-standard facilities to research and work on enterprise software and virtual environments to develop business solutions and systems. You'll have access to virtual learning environments, as well as networking, electronic, enterprise systems and business intelligence laboratories.

	<p>We are preparing you for the workplace. Your knowledge of the application of computing to provide IT solutions will evolve on a daily basis, and we will ensure you are able to innovate in order to deliver business value and sustainable solutions.</p> <p>Throughout your course you'll be supported by expert teaching staff, many of whom have worked in the field, are active in research and are continually innovating with industry.</p>
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<b>7</b>	<b>Course Awards</b>		
<b>7a</b>	<b>Name of Final Award</b>	<b>Level</b>	<b>Credits Awarded</b>
	Bachelor of Science with Honours Computer and Data Science	6	480
	Bachelor of Science with Honours Computer and Data Science with Professional Placement	6	600
<b>7b</b>	<b>Exit Awards and Credits Awarded</b>		
	Foundation Certificate Computing	3	120
	Certificate of Higher Education Computer Science	4	240
	Diploma of Higher Education Computer and Data Science	5	360
	Bachelor of Science Computer and Data Science	6	420

<b>8</b>	<b>Derogation from the University Regulations</b>
	Not applicable

9	Delivery Patterns			
Mode(s) of Study		Location(s) of Study	Duration of Study	Code(s)
Full Time		City Centre	4 years	US0922F
With Professional Placement		City Centre	5 years	US1080

<b>10</b>	<b>Entry Requirements</b>
	<p>The admission requirements for this course are stated on the course page of the BCU website at <a href="https://www.bcu.ac.uk/">https://www.bcu.ac.uk/</a> or may be found by searching for the course entry profile located on the UCAS website.</p>

<b>11</b>	<b>Course Learning Outcomes</b>
	<b>Knowledge</b>
<b>1</b>	Demonstrate knowledge and understanding of essential facts, concepts, theories and principles of computer/data science technology.
<b>2</b>	Knowledge and understanding of contemporary tools and technologies to produce solutions relevant to the domain of computer science/data science to meet a set of agreed requirements.
<b>3</b>	Understand the roles and responsibilities of a professional working within the computing profession.

<b>4</b>	Appreciate the social, environmental, ethical, economic and commercial considerations that impact on the computer/data science solutions.
	<b>Skills and Other Attributes</b>
<b>5</b>	Critically appraise and deploy effectively a range of theories, techniques and tools for the modelling, design and implementation of computer-based systems for the purposes of comprehension, communication, prediction and the understanding of trade-offs.
<b>6</b>	Specify the requirements and practical constraints of computer/data science solutions considering a wide range of aspects including legal, ethical and social issues.
<b>7</b>	Recognise and analyse criteria and specifications appropriate to specific problems, and plan strategies for their solution and future development
<b>8</b>	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.

12	Course Requirements																																										
12a	<p><b>Level 3:</b></p> <p><i>In order to complete this course a student must successfully complete all the following CORE modules (totalling 120 credits):</i></p> <table><tr><th>Module Code</th><th>Module Name</th><th>Credit Value</th></tr><tr><td>CMP3010</td><td>Fundamental Mathematics</td><td>20</td></tr><tr><td>BNV3001</td><td>Academic and Personal Study Skills</td><td>20</td></tr><tr><td>CMP3012</td><td>Web Application Design</td><td>20</td></tr><tr><td>CMP3013</td><td>Audio / Video Fundamentals</td><td>20</td></tr><tr><td>BNV3002</td><td>Independent Practice</td><td>20</td></tr><tr><td>CMP3009</td><td>Foundations of Programming</td><td>20</td></tr></table> <p><b>Level 4:</b></p> <p><i>In order to complete this course a student must successfully complete all the following CORE modules (totalling 120 credits):</i></p> <table><tr><th>Module Code</th><th>Module Name</th><th>Credit Value</th></tr><tr><td>CMP4267</td><td>Computer Systems</td><td>20</td></tr><tr><td>DIG4166</td><td>Website Design &amp; Development</td><td>20</td></tr><tr><td>CMP4272</td><td>Data Structures &amp; Algorithms</td><td>20</td></tr><tr><td>CMP4285</td><td>Innovation Project</td><td>20</td></tr><tr><td>CMP4266</td><td>Computer Programming</td><td>20</td></tr><tr><td>CMP4269</td><td>Network Fundamentals</td><td>20</td></tr></table>	Module Code	Module Name	Credit Value	CMP3010	Fundamental Mathematics	20	BNV3001	Academic and Personal Study Skills	20	CMP3012	Web Application Design	20	CMP3013	Audio / Video Fundamentals	20	BNV3002	Independent Practice	20	CMP3009	Foundations of Programming	20	Module Code	Module Name	Credit Value	CMP4267	Computer Systems	20	DIG4166	Website Design & Development	20	CMP4272	Data Structures & Algorithms	20	CMP4285	Innovation Project	20	CMP4266	Computer Programming	20	CMP4269	Network Fundamentals	20
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**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
DIG5127	Database & Web Application Development	20
CMP5353	Introduction to Data Science	20
CMP5329	Cyber Security	20
CMP5354	Software Design	20
CMP5352	Data Visualisation	20

**Professional Placement Year (optional)**

***In order to qualify for the award of Bachelor of Science with Honours Computer and Data Science with Foundation Year and Professional Placement Year, a student must successfully complete all of the modules listed as well as the following Level 5 module:***

Module Code	Module Name	Credit Value
PPY5004	Professional Placement	120

**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
CMP6202	Artificial Intelligence & Machine Learning	20
CMP6230	Data Management and Machine Learning Operations	20
CMP6228	Deep Neural Networks	20
CMP6207	Modern Data Stores	20
CMP6200	Individual Honours Project	40

## 12b Structure Diagram

### Year 1 Level 3

SEMESTER ONE	SEMESTER TWO
<b>Core</b> Fundamental Mathematics (20 credits) Academic and Personal Study Skills (20 credits) Web Application Design (20 credits)	<b>Core</b> Audio / Video Fundamentals (20 credits) Independent Practice (20 credits) Foundations of Programming (20 credits)

### Year 2 Level 4

SEMESTER ONE	SEMESTER TWO
<b>Core</b> Computer Programming (20 Credits) Computer Systems (20 Credits) Website Design and Development (20 Credits)	<b>Core</b> Data Structure and Algorithms (20 Credits) Network Fundamentals (20 Credits) Innovation Projects (20 Credits)

### Year 3 Level 5

<b>Core</b> Object Oriented Programming (20 Credits) Database and Web Application Development (20 Credits) Introduction to Data Science (20 Credits)	<b>Core</b> Cyber Security (20 Credits) Software Engineering Methodology & Project (20 Credits) Data Visualisation (20 Credits)
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**Professional Placement Year 4 (optional)**

**Professional Placement Module 120 Credits**

**Year 5 Level 6**

<b>Core</b> Artificial Intelligence & Machine Learning (20 Credits) Data Management and Machine Learning Operations (20 Credits)	<b>Core</b> Modern Data Stores (20 Credits) Deep Neural Networks (20 Credits)
Individual Honours Project (40 Credits)	

### 13 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

**32% time spent in timetabled teaching and learning activity**

Activity	Number of Hours
Scheduled Learning	384
Directed Learning	416
Private Study	400
<b>Total Hours</b>	<b>1200</b>

##### Balance of Assessment

Assessment Mode	Percentage
Coursework	95%
Exam	0
In-Person	5%

#### Level 4

##### Workload

**24% time spent in timetabled teaching and learning activity**

Activity	Number of Hours
Scheduled Learning	288
Directed Learning	498
Private Study	414
<b>Total Hours</b>	<b>1200</b>

##### Balance of Assessment

Assessment Mode	Percentage
Coursework	100%
Exam	0



In-Person	0%
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## 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
<b>Total Hours</b>	1200

### Balance of Assessment

Assessment Mode	Percentage
Coursework	87%
Exam	13%
In-Person	0

## Level 6

### Workload

20% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	240
Directed Learning	388
Private Study	372
<b>Total Hours</b>	1200

### Balance of Assessment

Assessment Mode	Percentage
Coursework	92%
Exam	0
In-Person	8%