

## Course Specification

Course Summary Information			
1	<b>Course Title</b>		BSc (Hons) Computer and Data Science
2	<b>BCU Course Code</b>	<b>UCAS Code</b>	US0922   I10C
3	<b>Awarding Institution</b>		Birmingham City University
4	<b>Teaching Institution(s)</b> (if different from point 3)		
5	<b>Professional Statutory or Regulatory Body (PSRB) accreditation</b> (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? Data Science is an exciting new discipline that integrates computer science and statistics, which helps enable you to gain valuable insights that are needed in modern organisations. The Computer and Data Science degree course is designed to equip you with the cutting-edge skills required to satisfy the global demand for Data Scientist, Machine Learning and Artificial Intelligence roles and thus build a rewarding career.</p> <p>This course shares a common first year with the Computer Science programme, covering fundamental concepts, such as algorithms and data structures, as well as 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>The Data Science element of the course focuses on the technical aspects of data science as well as developing a wider appreciation of how these principles can be applied elsewhere. You'll cover all aspects of data science, ranging from data acquisition, integration, storage, analysis and visualization of data. You'll also learn about data mining, statistical analysis, and machine learning by working collaboratively with academics and businesses, applying practice-based skills to real-life case studies and projects.</p> <p>You'll gain a well-rounded education in Computer and Data Science, whilst developing your teamwork and software development skills. When you graduate you'll be able to design software by applying mathematical and scientific principles, enabling you to thrive in the IT industry.</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>What's covered in the course?</b></p> <p>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.</p> <p>In your second year, you will consolidate your learning by studying four Computer Science</p>

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 your career. 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.

With emphasis on computer lab-based practical work and project delivery, this course will provide you with ample opportunity to acquire both the technical and transferable skills desired by industry. Extra support sessions in mathematics will be offered to students which will be led by a specialist mathematics tutor.

Underpinned by an extensive range of staff knowledge and skills, the course seeks to develop you into a confident independent and team problem solver who is willing to take on new challenges and experiences. You will be able to build an online portfolio for personal and professional development using software such as Mahara or GitHub.

We focus on employability so our course encourages and enables collaborative activity, engagement with work placements, projects and international exchanges. Various activities have been built into the course to promote employability such as innovation fest, mid-semester employability week and the mini project during level 4 induction week. You will have the opportunity to take a sandwich placement year between your second and third year. This is something that is highly recommended, as it will give you an invaluable opportunity to put your skills into practice, try out a potential career path and get relevant workplace experience that is valued by so many employers. The course is also part of the Erasmus scheme, which allows you to study abroad within the EU for a semester, normally during the second year of the course.

<b>7 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	360
	Bachelor of Science with Honours Computer and Data Science with Professional Placement Year	6	480
<b>7b Exit Awards and Credits Awarded</b>			
	Certificate of Higher Education Computer Science	4	120
	Diploma of Higher Education Computer and Data Science	5	240
	Bachelor of Science Computer and Data Science	6	300

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

<b>9 Delivery Patterns</b>			
<b>Mode(s) of Study</b>	<b>Location(s) of Study</b>	<b>Duration of Study</b>	<b>Code(s)</b>
Full Time	City Centre	3 years	US0922
With Professional Placement Year	City Centre	4 years	US1080

<b>10 Entry Requirements</b>	
	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.

<b>11 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.

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12a	<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 border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc;">Module Code</th> <th style="background-color: #ffffcc;">Module Name</th> <th style="background-color: #ffffcc;">Credit Value</th> </tr> </thead> <tbody> <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> </tbody> </table> <p><b>Level 5:</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 border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc;">Module Code</th> <th style="background-color: #ffffcc;">Module Name</th> <th style="background-color: #ffffcc;">Credit Value</th> </tr> </thead> <tbody> <tr> <td>CMP5332</td> <td>Object Oriented Programming</td> <td>20</td> </tr> <tr> <td>DIG5127</td> <td>Database &amp; Web Application Development</td> <td>20</td> </tr> <tr> <td>CMP5353</td> <td>Introduction to Data Science</td> <td>20</td> </tr> <tr> <td>CMP5329</td> <td>Cyber Security</td> <td>20</td> </tr> <tr> <td>CMP5354</td> <td>Software Design</td> <td>20</td> </tr> <tr> <td>CMP5352</td> <td>Data Visualisation</td> <td>20</td> </tr> </tbody> </table> <p><b>Professional Placement Year (optional)</b></p> <p><i>In order to qualify for the award of Bachelor of Science with Honours Computer and Data Science with Professional Placement, a student must successfully complete all of the Level 6 modules listed below as well as the following Level 5 module:</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc;">Module Code</th> <th style="background-color: #ffffcc;">Module Name</th> <th style="background-color: #ffffcc;">Credit Value</th> </tr> </thead> <tbody> <tr> <td>PPY5004</td> <td>Professional Placement</td> <td>120</td> </tr> </tbody> </table> <p><b>Level 6:</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 border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc;">Module Code</th> <th style="background-color: #ffffcc;">Module Name</th> <th style="background-color: #ffffcc;">Credit Value</th> </tr> </thead> <tbody> <tr> <td>CMP6202</td> <td>Artificial Intelligence &amp; Machine Learning</td> <td>20</td> </tr> <tr> <td>CMP6230</td> <td>Data Management and Machine Learning Operations</td> <td>20</td> </tr> <tr> <td>CMP6228</td> <td>Deep Neural Networks</td> <td>20</td> </tr> <tr> <td>CMP6207</td> <td>Modern Data Stores</td> <td>20</td> </tr> <tr> <td>CMP6200</td> <td>Individual Honours Project</td> <td>40</td> </tr> </tbody> </table>	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	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	Module Code	Module Name	Credit Value	PPY5004	Professional Placement	120	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
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**12b Structure Diagram**
**Level 4 – Year 1**

<b>SEMESTER ONE</b>	<b>SEMESTER TWO</b>
<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)

**Level 5 – Year 2**

<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 3 (optional)**
**Professional Placement Module (120 Credits)**
**Level 6 – Year 4**

<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)
<b>Individual Honours Project (40 Credits)</b>	

### 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, written examination and practical examination) depends to some extent on the optional modules chosen by students. The approximate percentage of the course assessed by coursework, written examination and practical examination is shown below.

#### 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%

#### 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>	<b>1200</b>

##### Balance of Assessment

Assessment Mode	Percentage
Coursework	90%
Exam	10%
In-Person	0

**Level 6****Workload****20% time spent in timetabled teaching and learning activity**

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

**Balance of Assessment**

<b>Assessment Mode</b>	<b>Percentage</b>
Coursework	92%
Exam	0
In-Person	8 %