Course Specification

Course Summary Information		
1	**Course Title**	Master of Research (MRes) in Computing
2	**Course Code**	PT1847-48
3	**Awarding Institution**	Birmingham City University
4	**Teaching Institution(s)** (if different from point 3)	Not applicable
5	**Professional Statutory or Regulatory Body (PSRB) accreditation** (if applicable)	Not applicable

6	**Course Description**
	MRes Computing – Shape the Future of Technology Through Research The **MRes Computing** is a research-intensive postgraduate programme designed to equip students with advanced methodological skills and expertise in emerging computational fields. Through rigorous training in computational research methods, research design, and emerging technologies, you will develop the ability to conduct independent inquiry, apply methodological rigor, and gain hands-on research experience. This course blends advanced research training with industry-relevant applications, ensuring you develop a strong foundation in computational research methodologies, problem-solving, and technology evaluation. The curriculum is designed to flexibly adapt to your research interests, allowing you to specialize in rapidly evolving areas such as: • **Artificial Intelligence** – Machine Learning, Deep Learning, Natural Language Processing, Computer Vision • **Data Science and Big Data** – Data Analytics, Databases, Web & Social Media Intelligence, Distributed Systems • **Cybersecurity and Privacy** – Ethical Hacking, Cyber-Physical Systems, Information Security Governance • **Human-Computer Interaction –** Human-Centred Design, Immersive Technologies (Augmented/Virtual Reality), Accessibility & Assistive Technology **Tailored Learning for Maximum Impact** The MRes in Computing enables you to tailor your research pathway by combining two specialist taught modules, which can be selected from specialised tracks (aligned with AI, Data Science, Cybersecurity, or Human-Computer Interaction). The programme offers one core modules, along with an independent research project: • Research Methods and Project Management (20 credits) – Develop the skills to execute high-impact research • Master's by Research (MRes) Thesis (120 credits) – Conduct a major research study with expert supervision Through this tailored learning, you will gain deep theoretical and practical expertise in your chosen research track, enabling you to: • Analyse complex computational problems • Evaluate and deploy advanced technologies • Develop innovative solutions through rigorous research • Contribute to technological advancements in academia and industry

	World-Class Research Environment and Industry Integration As an MRes Computing student at the College of Computing, Birmingham City University (BCU), you will be part of a thriving research and innovation ecosystem, collaborating with leading academics, industry experts, and innovation hubs. Benefit from: • Access to £70 million STEAMhouse innovation centre – A hub for cutting-edge technology and industry partnerships • Opportunities to work on real-world projects with leading organizations such as Cisco, Microsoft, Amazon AWS, NHS Digital, and West Midlands' tech industry • Specialized computing labs & research facilities equipped with state-of-the-art tools and high-performance computing resources **Your Future in Computing Research & Innovation** This programme is ideal for those looking to progress into PhD studies, R&D roles, or leadership positions in the tech sector. With a strong emphasis on research excellence, technological innovation, and industry application, graduates will be well-prepared to shape the future of computing—whether in academia, corporate research, or entrepreneurial ventures. If you are passionate about solving complex problems, driving innovation, and making a real impact in the world of computing, the MRes Computing at BCU is the perfect stepping stone for your ambitions. Are you ready to pioneer the next wave of technological breakthroughs? Join us at BCU and start your journey today!

7	**Course Awards**		
7a	**Name of Final Award**	**Level**	**Credits Awarded**
	Master of Research (MRes) in Computing	Level 7	180
7b	**Exit Awards and Credits Awarded**		
	Postgraduate Certificate (PGCert) in Computing	Level 7	60

8	**Variation from the University Regulations**
	This course has approved variations to the University's Academic Regulations. These can be accessed via the student contract page: https://www.bcu.ac.uk/student-info/student-contract

9	**Delivery Patterns**		
Mode(s) of Study	**Location(s) of Study**	**Duration of Study**	**Code(s)**
Full-time (Sept and Jan starts)	City Centre Campus	1 year	PT1848
Part-time (Sept and Jan starts)	City Centre Campus	2 years	PT1847

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 MRes Computing in the Department of Computer Science aims to: • Equip students with advanced research skills by providing high-quality training in computational research methodologies, enabling them to undertake independent and original research in computing and related disciplines. • Develop a strong research culture that fosters innovation, critical thinking, and interdisciplinary collaboration across areas such as Artificial Intelligence, Data Science, Cybersecurity, Human-Computer Interaction and emerging computing technologies. • Bridge academic research with industry applications by integrating real-world case studies, industry-led projects, and collaborations with key partners, ensuring that students can apply research to solve complex technological challenges. • Prepare students for doctoral study or research-intensive careers by providing them with the intellectual, technical, and professional tools necessary to design, conduct, and disseminate high-quality research with the potential for significant academic and industrial impact. • Promote ethical, responsible, and impactful research by embedding considerations of sustainability, security, accessibility or inclusivity and societal impact within computing research, ensuring graduates contribute to positive advancements in the field.

12	Course Learning Outcomes
Knowledge and Understanding	
1	Demonstrate mastery of a specialist area within computing through in-depth knowledge, critical awareness of current research, and contemporary technological advancements.
2	Design an original, feasible, and impactful research proposal within a chosen area of computing, such as Artificial Intelligence, Data Science, Cybersecurity, Human-Computer Interaction or other emerging technologies.
3	Critically evaluate and select the most appropriate research designs, methodologies, and computational tools to investigate complex computing challenges.
4	Develop comprehensive research skills, applying both qualitative and quantitative methods to analyse, model, and solve problems within computing disciplines.
5	Conduct a substantial independent research project that demonstrates originality, critical insight, and the potential for doctoral-level study or real-world application.
6	Apply reflective practice to emphasize the importance of lifelong learning, continuous professional development, and adaptability in the rapidly evolving field of computing.
Skills and Other Attributes	
7	Demonstrate self-direction and originality in tackling and solving problems in computing research.
8	Plan, manage, and execute a novel research project from inception to completion, working collaboratively with stakeholders, including supervisors, industry partners, and research participants, while ensuring timely delivery.
9	Continue to advance their knowledge and understanding in computing, and to develop new skills to a high level.
10	Demonstrate the qualities and transferable skills necessary for employment requiring the exercise of initiative and personal responsibility.

13	Level Learning Outcomes
Knowledge and Understanding *Upon completion of Postgraduate Certificate, students will be able to:*	
1	Demonstrate mastery of a specialist area within computing through in-depth knowledge, critical awareness of current research, and contemporary technological advancements.
2	Design an original, feasible, and impactful research proposal within a chosen area of computing, such as Artificial Intelligence, Data Science, Cybersecurity, Human-Computer Interaction or other emerging technologies.
3	Critically evaluate and select the most appropriate research designs, methodologies, and computational tools to investigate complex computing challenges.
4	Develop comprehensive research skills, applying both qualitative and quantitative methods to analyse, model, and solve problems within computing disciplines.
5	Conduct a substantial independent research project that demonstrates originality, critical insight, and the potential for doctoral-level study or real-world application.
6	Apply reflective practice to emphasize the importance of lifelong learning, continuous professional development, and adaptability in the rapidly evolving field of computing.

14	Course Learning, Teaching and Assessment Strategy
	The MRes in Computing offers a dynamic and innovative learning experience designed to cultivate advanced research skills and foster technological innovation. Our approach to learning, teaching, and assessment is carefully crafted to support your development as an independent researcher and innovator in the field of computing. **Learning and Teaching Approaches** Our programme employs a blend of structured learning and independent research, tailored to develop your skills as a computing researcher. The core module "Research Methods and Project Management," feature interactive workshops where you will engage with cutting-edge research tools and methodologies. These hands-on sessions allow you to work with advanced data analysis software, providing practical experience that complements theoretical knowledge. To enrich your learning experience, we offer a series of research seminars featuring leading academics, industry innovators, and fellow researchers. These expert-led sessions expose you to the latest trends and challenges in computing research, helping you contextualize your own work within the broader field. Collaborative projects form an integral part of our teaching approach. In these modules you will work in small teams to design and pitch research proposals, mirroring real-world R&D processes. This collaborative environment fosters peer learning and helps develop essential teamwork skills crucial for your future career. **Personalised Supervision and Support** At the heart of your MRes journey is the 120-credit Independent Research Project. To support this intensive research experience, you will be assigned two supervisors based on your research focus. These supervisors provide personalized guidance through regular one-to-one meetings, helping you refine your ideas, overcome challenges, and synthesize learning from taught modules with your independent research goals. **Assessment and Feedback** Our assessment strategy is designed to evaluate both your academic rigor and practical application of knowledge. You will encounter a diverse range of assessment methods, including research proposals, literature reviews, technical reports, code submissions, conference-style presentations, and practical demonstrations of implemented systems. The culmination of your

	work will be the 25,000-word dissertation and viva voce examination. Feedback is a crucial part of the learning journey. Each assessment includes detailed, forward-looking feedback, highlighting strengths and areas for improvement. This continuous feedback loop, including peer review exercises and formative assessments, supports your ongoing development throughout the course. **<u>Supporting the Learning Journey</u>** To enhance the learning experience, we offer additional resources such as research skills workshops, 24/7 access to our virtual learning environment, and opportunities to use our state-of-the-art STEAMhouse facilities for prototyping and experimentation. Writing retreats provide structured time for focused writing, with support from academic staff and peers. Through this comprehensive approach to learning, teaching, and assessment, the MRes in the Department of Computer Science, BCU aims to produce graduates who are not just consumers of knowledge, but creators and innovators, equipped to drive technological advancements and tackle the complex computational challenges of our time.

15	**Course Requirements**
15a	**Level 7:** ***In order to complete this course a student must successfully complete all the following CORE modules (totalling 140 credits):***

Module Code	**Module Name**	**Credit Value**
CMP7158	Research Methods and Project Management	(20 credits)
CMP7249	Masters by Research (MRes) Thesis	(120 credits)

In order to complete this course a student must successfully complete at least _40__ credits from the following indicative list of OPTIONAL modules. The student is required to choose 2 modules aligned with their selected track.

Module Code	Module Name	Credit Value
Track 1: Artificial Intelligence		
CMP7228	Machine Learning	(20 credits)
CMP7227	Data Visualisation	(20 credits)
This list of optional modules is reviewed and updated annually		
Track 2: Data Science and Big Data		
CMP7206	Data Mining	(20 credits)
CMP7214	Advanced Databases	(20 credits)
CMP7245	Database Design & Development	(20 credits)
CMP7173	Semantic Web and Knowledge Engineering	(20 credits)
Track 3: Cybersecurity and Privacy		
CMP7171	Advanced Ethical Hacking	(20 credits)
CMP7241	Information Security Governance	(20 credits)
CMP7166	Digital Forensics	(20 credits)
Track 4: Human-Computer Interaction		
CMP7215	Human-Centred Design	(20 credits)
CMP7216	UX Development	(20 credits)
CMP7217	Visual Interface Design	(20 credits)

15b Structure Diagram - Full time students September cohorts

Level 7

(September starts)

Semester 1	Semester 2	Semester 3
	Masters by Research (MRes) Thesis (120 credits)	
Core Module Research Methods and Project Management (20 Credits)		
Optional Module 1 One available selection from the chosen track (20 credits).		
Optional Module 2 One available selection from the chosen track (20 credits).		

15b Structure Diagram- Part time students

Level 7

(September starts)

Study Year	Semester 1	Semester 2	Semester 3
Year 1	Core Research Methods and Project Management (20 Credits)	Optional 1 One available selection from the chosen track (20 credits). Optional 2 One available selection from the chosen track (20 credits).	
Year 2	Master's by Research (MRes) Thesis (120 credits)		

The Part-Time MRes programme structure is designed to provide a flexible yet comprehensive learning experience. Students will complete two taught modules each year and the dedicated research project 'Master's by Research (MRes) Thesis (120 credits)' module will run across two years.

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 7
Workload

8% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	144
Directed Learning	256
Private Study	1400
Total Hours	1800

Balance of Assessment

Assessment Mode	Percentage
Coursework	85%
Exam	
In-Person	15%