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| Programme Title | Data Visualisation |
| Awarding Body | Ravensbourne University London |
| Teaching Institution | Ravensbourne University London |
| Final Award | Level 7 - MSc Data Visualisation, MA Data Visualisation |
| Interim awards | PGDip HE  PGCert HE |
| UCAS Code |  |
| QAA Subject Benchmark | Computing (postgraduate), 2019 |
| PRSB reference |  |
| Mode of study | 1 year Full-time |
| Date produced/amended |  |
| Course Leader |  |

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| Distinctiveness |
| Ravensbourne has an established international reputation for innovation at the intersection of design and digital media. The proposed suite of MSc programmes – of which the MSc/MA Data Visualisation programme is an integral part – seeks to capitalise on and consolidate these past successes, expanding Ravensbourne’s activities from its current position as innovative user of technologies to innovative creator of technologies. The course invites prospective postgraduate students to be part of that journey, empowering them to draw on and learn from this rich history of innovative design thinking and apply this to the creation of new technologies.  To facilitate this, the MSc and MA Data Visualisation combined programme is targeted at graduates and professionals who have a background in computing and/or the arts, who are seeking to update their skillset to encompass working with, understanding and telling stories with data. To this end, the programme offers two interrelated pathways. Both programmes share modules in Data Security and Privacy, Programming, Storytelling with Data, Data Visualisation in Context and Interactive Visualisation. In tackling these fields, both programmes seek to develop the student’s understanding of legal and compliance requirements when working with data; their ability to extract meaning from data; and their creative ability to make data insights tangible to others. In terms of divergence, MSc Data Visualisation offers students a more mathematical approach to working with data with a specialist module in Mathematics for Data Analysis. It also requires students to undertake a scientifically focused dissertation project. MA Data Visualisation emphasises the design aspects of Data Visualisation through a specialist module in Interaction Design for Data. It also requires students to undertake a design-focused dissertation project. Regardless of emphasis, the curriculum on both the MSC and MA takes a learning-by-doing approach, challenging students to focus on applying their developing knowledge to develop solutions to real-world challenges in a wide range of domains.  Along with the previously mentioned technology-focused modules, the programme also includes three core research, business and innovation focused modules designed to deepen and expand the student’s understanding of the application of technical skills to solving real-world challenges. The *Innovation and Responsibility* module enables students to critically explore the positive and negative effects of the technologies and data processing on the world and society. The *Business Development* module examines the world of business, inviting students to consider how their skills may be applied both within existing businesses and to generate start-ups. Finally, the *Dissertation Project* enables students to bring their interests and passions to bear on a non-trivial research project underpinned by either scientific and/or design methodologies.  A significant benefit of Masters level study is the expansion of students’ professional network. In recognition of this and in anticipation of the benefits that arise from it, MSc/MA Data Visualisation shares the three core non-technical modules with its sister programmes MSc Computer Science, MSc Cyber Security and MSc Artificial Intelligence. In sharing these modules, the curriculum seeks to facilitate peer-to-peer learning and collaboration between students with differing knowledge and expertise.  Term 1  In term one, Data Visualisation students will undertake modules in *Data Security and Privacy* and *Programming for Data Visualisation*. In the former, students will learn about legislation governing data handling and processing. They will also learn about the privacy and security challenges that arise as a result of data handling and processing. In Programming for Data Visualisation, students will learn fundamental techniques for representing and manipulating data through code. Along with these modules, MSc students will undertake *Mathematics for Data Analysis*. This module will introduce them to core techniques for making sense of data through mathematical analysis. MA students will undertake *Interaction Design for Data*. This module will introduce them to core concepts and techniques from the field of interaction design which are vital for both collecting and applying data in the design of solutions. Alongside these modules, students will also undertake the *Innovation and Responsibility* module with their peers from sister programmes in Cyber Security, Computer Science and Artificial intelligence. In doing this, students will be encouraged to consider how their specialist knowledge complements that of their peers on their sister programmes.  Term 2  In term two, students will undertake modules in *Storytelling with Data* and *Business Development*. In *Storytelling with Data*, students will learn and explore a range of techniques for making data insights tangible to various audiences and demographics. This will necessarily require them apply the techniques and skills they developed in term 1. The Business Development module, which is shared with their peers from other programmes, provides a space for students to develop an understanding of how their skills may be applied to the world of business. Alongside this, students begin their *dissertation module*, which will run until the end of term 3. The dissertation module will introduce students to postgraduate-level research methodologies and invite them to design and execute a non-trivial piece of research.  Term 3  In term three, students are introduced to modules in *Data Visualisation in Context* and *Interactive Visualisation*. In Data Visualisation in Context, students are invited to examine and utilise data within the location in which it is generated, so as to make the data insights tangible. In Interactive Visualisation students will explore a wide variety of techniques for making data interactive and visual. Alongside this, students will continue their dissertation research which will conclude in this term.  Overall, the programme provides students with an excellent opportunity to improve their skillset, expand their technical knowledge and deepen their understanding of how Data Visualisation can be applied to generate insights in complex situations.  In summary, the distinctive features of the programme include:   1. Learning-by-doing approach to Data Visualisation 2. Professional networking opportunities with other postgraduate students from other disciplines 3. Integrated art and science programme enabling interdisciplinary peer-to-peer learning |

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| Programme aims |
| * To produce graduates who can apply Data Visualisation skills and knowledge to engineer solutions to real-world challenges |
| * To improve student understanding of the relevance of Data Visualisation across a broad range of domains |
| * To support and encourage the development of an innovation mindset |
| * To enable students to identify professional development goals that may lead them into future career opportunities |
| * To support students in developing a professional network via interactions with peers, tutors and other professionals, that may provide future value and support to them as their career develops |
| * To encourage students to understand and embrace the concept of becoming a lifelong learner |

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| Programme Learning Outcomes |
| The course provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas.  On completion of the course students will be able to: |
| LO 1 Research/Inspiration  Select and evaluate information gathering techniques using a wide range of sources, providing visual, contextual and industry case-study research as appropriate.  Related Principle: ORIGINATE |
| LO 2 Concept/Ideation  Critically appraise and evaluate appropriate research materials to generate workable concepts or strategic project themes that inform and underpin project development.  Related Principle: ORIGINATE |
| LO 3 Development/Prototyping  Investigate potential pathways that result in appropriate solutions, informed by a systematic understanding of the principles of the creative process.  Related Principle: INTEGRATE |
| LO 4 (Pre) Production  Demonstrate systematic working knowledge, production skills, selection, application and understanding of a selection of processes, materials and methods that inform creative and academic practice.  Related Principle: COLLABORATE |
| LO 5 Presentation /Storytelling For Influence  Communicate projects creatively and professionally, whether in visual, oral or written form. Methods of presentation are appropriate to the audience/client and the purpose of the work.  Related Principle: ADVOCATE |
| LO 6 Critical and creative mindsets  Evaluate a range of critical approaches in order to form an independent position  Related Principle: ORIGINATE |
| LO 7 Employability  Effectively employ professional transferrable and employability skills, including the ability to manage time and work to clear briefs and deadlines, respond to set goals, and communicate effectively.  Related Principle: CULTIVATE |
| LO 8 Professional Identity  Align your professional identity as a practitioner with a viable career context.  Related Principle: CULTIVATE |

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| Learning and Teaching Methods | Assessment Strategy |
| Formal learning and teaching methods applied on this programme will predominantly take the form of:   * Lectures * Practical Labs * Seminars * Research Projects * Tutorials (Group and Individual)   These methods will be applied across the programme in keeping with wider established practices in the field of Data Visualisation education. Other methods may be applied as curricular enhancements, as deemed appropriate by the delivery team. These may include:   * Flipped classroom activities * Live industry projects and/or briefs * Guest speaker talks * Hackathons | An appropriate range of assessment methods will be used across the programme. Portfolios are used for several assessments. In the context of Data Visualisation these will normally consist of some form of practical work and may optionally include some form of written report. For example, a data visualisation in software (practical) may be accompanied by formal evaluation of a dataset (written). Portfolios are selected for summative assessment since they may be assessed holistically. The mark is derived from the relationship between the elements rather than based on each single element considered in isolation. This gives the lecturer the optimum opportunity to mark to reward while providing meaningful feedback to help the student develop.  Aside from portfolios, other common assessment strategies will predominantly include:   * Reports * Presentations * Engineering Projects   Summative and formative assessment will be given in line with university regulations. Within Data Visualisation, formative assessment will play a key part in helping students orientate and calibrate their skills. This may take place through class-based exercises and through activities in the Virtual Learning Environment (VLE). For example, lecturers may present quizzes in the VLE that allow students to undertake simple exercises to test their memory of material covered in class. |

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| Unit Code | Unit Title | Credits |
| Level 7 |  |  |
| 1 | Data Security & Privacy | 15 |
| 2 | Mathematics for Data Analysis\* | 15 |
| 3 | Interaction Design for Data\*\* | 15 |
| 4 | Programming for Data Visualisation | 15 |
| 4 | Innovation and Responsibility | 15 |
| 5 | Storytelling with Data | 15 |
| 6 | Business Development | 15 |
| 7 | Data Visualisation in Context | 15 |
| 8 | Interactive Visualisation | 15 |
| 9 | Dissertation Project | 60 |
|  | | **180** |

*Yellow highlighted modules are shared modules as discussed in the introduction to this document.*

*\*MSc students only \*\* MA Students only*

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| Entry Requirements | |
| Students will normally be expected to have a 2:1 or above in an undergraduate degree in Computing, Mathematics, Design or an Arts subject. Alternatively, professional experience working in a relevant field may also make a candidate eligible for study on this programme.  Where an applicant’s first language is not English, proof of competence in English will be required. For undergraduate and postgraduate programmes, this will normally take the form of an approved English language test at B2 level in the Common European Framework of Reference. Any test for proficiency in English must have been achieved within 18 months preceding the date of entry. Individual programmes may have higher language requirements. Ravensbourne’s international department will advise applicants on the language requirements for particular programmes.  Selection Criteria  Ravensbourne will use a number of methods to assess an applicant’s suitability for their course of choice. Primarily applicants are selected on the basis of:   * an applicant’s prior academic achievement/qualifications and/or previous employment/life experience; * assessment of the applicant’s ability and aptitude to succeed on the course for which s/he has applied.   Students will be selected according to the generic criteria set out below:  Personal attributes   * shows commitment, enthusiasm and interest in the subject area * initiative and problem solving * ability to communicate   Creative process   * can generate ideas and use external sources to develop them * ability to research an idea and follow it through to a finished product   Study skills   * can understand and organise information clearly * can investigate and analyse information * shows reasoning and intellectual curiosity   Professional skills   * has shown they can initiate and deliver projects * can work in a team and with people with different skills * has shown confidence with IT   Career aspirations   * understands the relevance of the course to her/his career ambitions * understands current debates within industry | |
| Accreditation of Prior Learning | |
| Applications are welcomed from those who may not possess formal entry qualifications, mature students, those with work experience or with qualifications other than those listed above. Such applicants should demonstrate sufficient aptitude and potential to complete the course successfully. Applicants will be assessed at interview in accordance with Ravensbourne’s Accreditation of Prior Learning Policy and Procedure. | |
| Student Support | <http://intranet.rave.ac.uk/display/SS/Student+Support> |
| Assessment Regulations | <http://intranet.rave.ac.uk/display/RA/Assessment+-+UG+and+PG> |

The following table maps Data Visualisation LOs to modules. Programme LOs are given in keeping with the requirements of the form. The specific LOs are given after the following table. The given LOs will be translated into unit level outcomes in keeping with the Ravensbourne’s move to unit level LOs.

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| **Level 7** | | | | | | | | | |
| Course LOs | Unit 1 | Unit 2 | Unit 3 | Unit 4 | Unit 5 | Unit 6 | Unit 7 | Unit 8 | Unit 9 |
| LO 1 | X | X | X |  | X |  | X | X |  |
| LO 2 | X | X | X |  | X |  | X | X |  |
| LO 3 | X | X | X |  | X |  | X | X |  |
| LO 4 |  |  |  | X |  | X |  |  | X |
| LO 5 |  |  |  | X |  | X |  |  | X |
| LO 6 |  |  |  |  |  |  |  |  | X |

**Data Visualisation LOs derived from QAA Computing Benchmark (Postgraduate):**

1. Critically apply tools and technical skills to identify and model data visualisations.
2. Use established concepts and techniques from the study of Data Visualisation to propose and analyse solutions to a range of challenges.
3. Solve a range of current and emerging challenges, demonstrating critical selection, evaluation and application of Data Visualisation tools and techniques.
4. Select and apply appropriate processes to comply with the legal and compliance requirements governing the control and processing of data in ways appropriate to real-world scenarios.
5. Evaluate, refine, and apply comprehensive analytical, technical and creative skills to solve a significant Data Visualisation challenge.
6. Define a significant Data Visualisation challenge, and professionally manage a process of work to propose and execute a viable solution to it using a recognised project management strategy.

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| Description of the Course |
| *This section will also be used for other purposes, such as prospectus, marketing, website etc.*  MSc/MA Data Visualisation  If you are a Computing, Design or Arts graduate or professional seeking to expand your skills and knowledge to encompass Data Visualisation, then this is the programme for you. Offering either an MSc or an MA pathway through a shared pedagogical framework, the curriculum takes a practical approach, offering modules in Data Security and Privacy, Mathematics for Data Analysis, Programming for Data Visualisation, Interaction Design for Data Visualisation, Storytelling with Data, Data Visualisation in Context and Interactive Visualisation. Alongside these technical modules, you will also undertake modules in business, innovation, and responsibility. These modules will be shared with students from sister programmes in Computer Science, Cyber Security, and Artificial Intelligence. Through this, you will gain the opportunity to meet students from other specialisms and expand your professional network, as well as your expertise. Through all this, the aim is to equip with you with the skillset and mindset required to work across a range of fields in order to design solutions to real world challenges.  Why Study This Course?  Ravensbourne has an established international reputation for innovation at the intersection of design and digital media. The MSc/MA Data Visualisation programme capitalises on and consolidates these past successes, offering you an education that nurtures your ability to innovate while developing your skills and knowledge of Data Visualisation.  The programme also aims to promote networking among Masters students from different fields and backgrounds. In so doing the aim is to help you increase the size and diversity of your professional network, in order to maximise your chances of future career success.  Career opportunities  A wide range of technical and non-technical roles are available to Data Visualisation graduates. Common career trajectories include:   * Data Protection Officer * Data Analyst * Data Security & Privacy consultant * Interaction designer * UX Designer * Museum Exhibition Developer |

Academic Framework – Course Diagram

## MSc Data Visualisation

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| **Term 1** | **Term 2** | **Term 3** |
| **Data Security & Privacy**  15 credits | **Storytelling with Data**  15 credits | **Data Visualisation in Context**  15 credits |
| **Mathematics for Data Analysis**  15 credits | **Business Development**  15 credits | **Interactive Visualisation**  15 credits |
| **Programming for Data Visualisation**  15 credits | **Dissertation Project**  60 credits | |
| **Innovation and Responsibility**  15 credits |

## MA Data Visualisation

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| **Term 1** | **Term 2** | **Term 3** |
| **Data Security & Privacy**  15 credits | **Storytelling with Data**  15 credits | **Data Visualisation in Context**  15 credits |
| **Interaction Design for Data**  15 credits | **Business Development**  15 credits | **Interactive Visualisation**  15 credits |
| **Programming for Data Visualisation**  15 credits | **Dissertation Project**  60 credits | |
| **Innovation and Responsibility**  15 credits |