

### Programme Specification

1	<b>Awarding body</b>	University of London
2	<b>Teaching Institution</b>	<b>Birkbeck College</b>
3	<b>Programme Title(s)</b>	<b>MSc Geographic Data Science</b> <b>PG Dip Geographic Data Science</b> <b>PG Cert Geographic Data Science</b> <b>PG Cert Geographic Data Science (intensive)</b>
4	<b>Programme Code(s)</b>	TMSGDATS_C (MSc) TPDGDATS_C (PG Dip) TPCGDATS_C (PG Cert) TPCGDATI_C (PG Cert intensive version)
5	<b>UCAS code (if applicable)</b>	N/A
6	<b>Home Department</b>	Geography
7	<b>Exit Award(s)</b>	PG Dip Geographic Data Science PG Cert Geographic Data Science
8	<b>Duration of Study (number of years)</b>	1 year (FT) or 2 years (PT)
9	<b>Mode of Study</b>	FT <b>X</b> PT <b>X</b> DL
10	<b>Level of Award (FHEQ)</b>	7
11	<b>Other teaching depts or institution</b>	N/A
12	<b>Professional, Statutory Regulatory Body(PSRB) details</b>	N/A
13	<b><u><a href="#">QAA Benchmark Statement</a></u></b>	N/A

14	<b>Programme Rationale &amp; Aims</b>
	<p>The programme is motivated by Birkbeck's mission to provide opportunities for students from a wide range of cultural backgrounds to undertake study that enhances their personal skills and employability. Within the Diploma, students will gain practical skills and a conceptual understanding of Geographic Data Science, which are increasingly recognised as desirable skills by prospective employers.</p> <p>The programme is also motivated by the following factors:</p> <ul style="list-style-type: none"> <li>• The rapidly expanding aspect of computer applications throughout the world which motivates the need for practical skills and a conceptual understanding of Geographic Information Systems (GIS).</li> <li>• The understanding that there is a market for a course in Geographic Data Science tailored for students with limited experience in GIS and want to start building knowledge and skills in the theoretical and practical aspects of GIS, which would enable them to enter a new job market, build up their career, or pursue further study in geography or GIS or any other related fields at undergraduate/postgraduate levels.</li> <li>• The fast-changing educational and training needs for professionals in the dynamically developing geo- information sector.</li> </ul>

	<p>The MSc programme comprises eight taught modules and one research module that consist of a balanced combination of theoretical topics and practical hands-on exercises in which students apply the theoretical concepts. Students following the PG Diploma programme take the eight taught modules only, and those following the PG Cert take the first four taught modules only.</p> <p>The curriculum for this course is purposefully designed to accommodate (1) face-to-face support and tutoring in class, and (2) a number of hands-on practical experiences so that the students can start developing their theoretical knowledge and practical skills in GIS from an introductory level.</p> <p>The curriculum of this programme was structured around “GIS&amp;T Body of Knowledge” , which is a document published by the Association of American Geographers in 2006 and produced by scholars from some 80 institutions within UCGIS (University Consortium for Geographic Information Science). The document is considered as a valuable resource for planning the courses and curricula for academic and professional programmes in Geographic Information Science and Technology.</p> <p>The definition of academic standards is guided by qualification descriptors laid down in the Framework for Higher Education. The following factors specified by these descriptors were considered to be of particular importance for this programme:</p> <ul style="list-style-type: none"> <li>• a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights;</li> <li>• a comprehensive understanding of techniques applicable to a practical project;</li> <li>• a practical understanding of how established techniques and enquiry are used to create and interpret knowledge; and</li> <li>• conceptual understanding that enables the students to evaluate critically current problems, and to evaluate the GIS methodologies.</li> </ul>
15	<b>Entry Criteria</b>
	<p>The normal minimum entrance requirement is at least a second class honours degree in geography, computer science or cognate discipline (or their international equivalents). Some experience with a GIS is desirable.</p> <p>The admissions tutor has discretion to consider applicants with (1) a degree of a lower standard than a second class honours degree (or equivalent) or (2) relevant professional experience instead of a degree, but the tutor must be satisfied that these applicants are as well prepared to enter the programme as those candidates who meet the normal entrance requirement. This is determined after a formal application has been submitted.</p>
16	<b>Learning Outcomes</b>
	<p>On successful completion of this programme a student will be expected to be able to:</p> <p><b>Subject Specific:</b></p> <p>On successful completion of the course the student will have demonstrated an ability to:</p> <ul style="list-style-type: none"> <li>• gain practical experience of using at least two commercial GIS software packages;</li> <li>• understand the computer programming principles used to extend GIS operation to undertake software customisation and development;</li> </ul>

	<ul style="list-style-type: none"> <li>• relate theory surrounding digital representation of spatial phenomena to practical analysis of spatial data;</li> <li>• relate theory surrounding spatial analysis methodologies to applied spatial analysis tasks.</li> </ul> <p><b>Intellectual:</b> On successful completion of the qualification the student will have demonstrated an ability to:</p> <ul style="list-style-type: none"> <li>• conceptualise theoretical concepts for the representation of spatial data;</li> <li>• justify appropriate spatial analysis methodologies relevant to applications of GIS;</li> <li>• critically evaluate applications of GIS;</li> <li>• apply problem-solving strategies for GIS software customisation and development;</li> <li>• apply theoretical understanding of spatial data models to a selection of appropriate GIS methods for solving spatial problems.</li> </ul> <p><b>Practical:</b> On successful completion of the qualification the student will have demonstrated an ability to:</p> <ul style="list-style-type: none"> <li>• import, integrate, manipulate, analyse and report spatial data using contemporary GIS packages;</li> <li>• undertake GIS software customisation and development tasks using a contemporary programming language;</li> <li>• report and discuss methods, analysis techniques and results from GIS-based projects;</li> <li>• select and apply appropriate spatial statistical techniques;</li> <li>• work successfully with diverse data formats and standards.</li> </ul> <p><b>Personal and Social:</b> On successful completion of the qualification the student will have demonstrated an ability to:</p> <ul style="list-style-type: none"> <li>• undertake individual project work;</li> <li>• undertake active participation in discussions with tutors and peers;</li> <li>• plan effectively and organize work schedules;</li> <li>• complete work in accordance to deadlines;</li> <li>• communicate and collaborate successfully with student body.</li> </ul>
17	<p><b>Learning, teaching and assessment methods</b></p> <p><b>Learning and Teaching Methods:</b> Most scheduled teaching sessions are either lectures or practical computing sessions held in a workstation room and making use of GIS software. For each session, materials are delivered by the internet in advance and aim to serve as the basis for the lectures on each module.</p> <p>Workstation sessions allow students to gain practical experience for themselves in the analysis and modelling of data. They are therefore part of a self-paced learning process. Students work individually using detailed guidance notes and discuss their results and any difficulties amongst themselves and with the members of staff present to provide tutorial assistance.</p> <p>Other teaching and learning methods include:</p> <ul style="list-style-type: none"> <li>• Self-paced practical exercises with step through instructions and datasets delivered through the online learning environment;</li> </ul>

- Individual project work aimed at extending practical skills gained from practical exercises;
- Undertaking of independent research for the development and completion of an MSc dissertation;
- Access to the Birkbeck Electronic Library which provides a range of relevant resource materials in a format that is accessible online. Students are strongly encouraged to utilise this facility.

The learning methods outlined above promotes a balance of learning through individual study and peer/tutor interaction. It ensures the development of practical skills in GIS application supported by a foundation in the necessary theoretical and conceptual material. The self-paced nature of much of the materials allows students to adopt a flexible approach to their learning whilst ensuring that students develop the ability to manage their work schedules and meet deadlines.

### **Assessment Methods:**

The following methods of assessment are used in this programme:

#### **1. Theoretical and practical assessed coursework**

Each of the eight taught modules is assessed through an essay (practical GIS work) at the end of each module. Each essay is designed to enable the students to assimilate the materials and to promote a deeper and more comprehensive understanding of and engagement with the respective module.

The contributions from coursework ensure that throughout the year students get practice and are given feedback independently without the time pressure of examinations.

The type of questions and problems set within the assignments are designed to cover both theory and practice, address the individual learning outcomes, and discriminate between different levels of achievement. However, the assessment strategy recognises that students may exhibit a varying degree of aptitudes and abilities in different aspects of the course and may also perform better through different forms of assessment. This is particularly relevant to Birkbeck students who vary considerably in terms of their academic background, prior work experience, current career path and future career plans. The assessment strategy is therefore designed to:

- ensure a good coverage of the curriculum and address the range of learning outcomes
- perform an on-going formative function via the theoretical and practical assignments associated with all course modules
- give all students the opportunity to demonstrate their strengths and show what they can do well

#### **2. A dissertation**

The dissertation module is assessed by:

##### **a) Research proposal and literature review**

This component of the dissertation module consists of two tasks. In the first part, students will develop their own research proposal for their MSc thesis. The core learning objective of this is to identify the relevant research topic and to acquire the practical

and written skills in constructing and presenting an independent research project. It is expected to help the students develop, sustain or initiate their dissertation research and to think strategically about their timetable until the completion of their dissertation in the coming months; whilst also allowing the GIS Team to identify an appropriate advisor who can guide and support them through this work. In the second part of the dissertation module, they will prepare and submit a piece of literature review for their dissertation. It aims to help them clarify the significance of their research and facilitate their discussion with their supervisor to refine their research direction. Both tasks are subject to formative assessment.

#### b) MSc dissertation

In their dissertation project, students are required to undertake an independent research project. Assessment criteria reflect professional requirements with respect to the methodological and practical knowledge of GIS as well as good knowledge of the background to the problem, clear identification of the question to be investigated or the problem to be solved, selection of suitable data and analysis techniques, and the ability to draw conclusions that are consistent with the analysis and to communicate the results in writing as well as through visual output (maps and figures) in a way that is accessible by the general, non-expert audience. Coursework and dissertation are all double marked. Students are provided with written feedback on all submitted coursework elements, usually within four weeks of submission. All marks are moderated by the External Examiner, who is also asked to comment on the suitability of the assessment methods, criteria and procedures.

The assessment methods are reviewed annually by all contributing staff to ensure that our assessment methods appropriately tests key skills and accurately reflects the abilities and academic capacity of students with diverse educational backgrounds and life experiences. They are also discussed with the External Examiner annually through relevant board meetings with scope for further discussion facilitated by the External Examiners' written comments.

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### **Programme Description**

The MSc programme comprises eight taught modules and one research module. The taught modules consist of a combination of theoretical topics with supplemented practical hands-on exercises in which student apply the theoretical concepts.

The first set of four modules are designed to offer collectively a broad education and training at the postgraduate level. The "Introduction to Geographic Information Systems" and the "Spatial Big Data Management" modules cover a range of fundamental topics and training in GISc at the introductory level, including digital spatial data formats and cartographic concepts. The "Programming for GIS" module provides GIS professionals with the opportunity to learn basic programming skills, focusing on the process of customising GIS packages, while "Geovisualisation and Web Technologies" extends the cartographic and programming skills acquired through the first three modules to explore more advanced cartographic representations and develop web applications using different media and formats.

	<p>The second set of four modules are aimed at providing advanced training in a comprehensive and structured manner so as to specialise more and exceed the general exposure achieved through the first four modules. “Spatial Analytics” introduces quantitative methods and techniques for analysing spatial data. The “Spatial Simulation Modelling” and the “Advanced Geospatial Analytics” modules aim to build on topics covered in “Spatial Analytics” and introduce more advanced GIS analysis and modelling techniques that cater for specific applications. The module “Remote Sensing and Environmental Dynamics” exposes students to advanced knowledge of remote sensing data and techniques as well as modelling environmental data and processes using GIS.</p> <p>The programme provides an exit point, in the form of the Post-graduate Certificate in Geographic Data Science, for those who have completed the first four modules and those who do not wish to proceed to a more advanced training. The programme provides another exit point in the form of the Post-graduate Diploma in Geographic Data Science, for those who have completed all eight taught modules and have gained advanced knowledge in GIS but do not wish to continue on the dissertation project. There is also an intensive version of the PG Cert for those who wish to complete within a term.</p> <p>The final module of the MSc is the MSc Dissertation, which consists of an independent research phase in which students produce their MSc dissertation. It is designed for the students to introduce and integrate all knowledge and skills they will have acquired through the eight taught modules. The successful completion of that module will lead to the award of the final degree, the Master of Science in Geographic Data Science.</p>
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19	Programme Structure			
Full Time MSc programme – 1 year				
Year 1				
Level	Module Code	Module Title	Credits	Status
7	GGPH035H7	Introduction to Geographic Information	15	Compulsory
7	SSGE043H7	Spatial Big Data Management	15	Compulsory
7	SSGE047H7	Programming for GIS	15	Compulsory
7	SSGE048H7	Geovisualisation and Web Technologies	15	Compulsory
7	SSGE049H7	Remote Sensing and Environmental Dynamics	15	Compulsory
7	SSGE044H7	Spatial Analytics	15	Compulsory
7	SSGE046H7	Advanced Geospatial Analytics	15	Compulsory
7	SSGE045H7	Spatial Simulation Modelling	15	Compulsory
7	GGPH017D7	GDS Dissertation	60	Compulsory
Part Time MSc programme – 2 years				
Year 1				
Level	Module Code	Module Title	Credits	Status
7	GGPH035H7	Introduction to Geographic Information	15	Compulsory
7	SSGE043H7	Spatial Big Data Management	15	Compulsory
7	SSGE047H7	Programming for GIS	15	Compulsory
7	SSGE048H7	Geovisualisation and Web Technologies	15	Compulsory

<b>Year 2</b>				
7	SSGE049H7	Remote Sensing and Environmental	15	Compulsory
7	SSGE044H7	Spatial Analytics	15	Compulsory
7	SSGE046H7	Advanced Geospatial Analytics	15	Compulsory
7	SSGE045H7	Spatial Simulation Modelling	15	Compulsory
7	GGPH017D7	GDS Dissertation	60	Compulsory

**Full Time PG Dip programme -1 year**

<b>Year 1</b>				
Level	Module Code	Module Title	Credits	Status
7	GGPH035H7	Introduction to Geographic Information	15	Compulsory
7	SSGE043H7	Spatial Big Data Management	15	Compulsory
7	SSGE047H7	Programming for GIS	15	Compulsory
7	SSGE048H7	Geovisualisation and Web Technologies	15	Compulsory
7	SSGE049H7	Remote Sensing and Environmental Dynamics	15	Compulsory
7	SSGE044H7	Spatial Analytics	15	Compulsory
7	SSGE046H7	Advanced Geospatial Analytics	15	Compulsory
7	SSGE045H7	Spatial Simulation Modelling	15	Compulsory

**Part Time PG Dip programme - 2 years**

<b>Year 1</b>				
Level	Module Code	Module Title	Credits	Status
7	GGPH035H7	Introduction to Geographic Information	15	Compulsory
7	SSGE043H7	Spatial Big Data Management	15	Compulsory
7	SSGE047H7	Programming for GIS	15	Compulsory
7	SSGE048H7	Geovisualisation and Web Technologies	15	Compulsory
<b>Year 2</b>				
7	SSGE049H7	Remote Sensing and Environmental	15	Compulsory
7	SSGE044H7	Spatial Analytics	15	Compulsory
7	SSGE046H7	Advanced Geospatial Analytics	15	Compulsory
7	SSGE045H7	Spatial Simulation Modelling	15	Compulsory

**Part Time PG Cert programme (2 terms, Autumn and Spring)**

<b>Year 1</b>				
Level	Module Code	Module Title	Credits	Status
7	GGPH035H7	Introduction to Geographic Information	15	Compulsory
7	SSGE043H7	Spatial Big Data Management	15	Compulsory
7	SSGE047H7	Programming for GIS	15	Compulsory
7	SSGE048H7	Geovisualisation and Web Technologies	15	Compulsory



**Part Time PG Cert intensive programme (1 term - Autumn)****Year 1**

Level	Module Code	Module Title	Credits	Status
7	GGPH035H7	Introduction to Geographic Information	15	Compulsory
7	SSGE043H7	Spatial Big Data Management	15	Compulsory
7	SSGE049H7	Remote Sensing and Environmental	15	Compulsory
7	SSGE044H7	Spatial Analytics	15	Compulsory

**Status\***

CORE – Module must be taken and passed by student; COMPULSORY – Module must be taken, mark can be reviewed at sub-exam board; OPTIONAL – Student can choose to take this module

20	<b>Regulations</b>
	<ul style="list-style-type: none"> <li>• <b>Admissions</b> This programme adheres to the College Admissions Policy: <a href="http://www.bbk.ac.uk/registry/policies/documents/admissions-policy.pdf">http://www.bbk.ac.uk/registry/policies/documents/admissions-policy.pdf</a></li> <li>• <b>Credit Transfer</b> Accredited Prior Learning will be considered in line with the College Policy on Accredited Prior Learning <a href="http://www.bbk.ac.uk/registry/policies/documents/accreditation-prior-learning.pdf">http://www.bbk.ac.uk/registry/policies/documents/accreditation-prior-learning.pdf</a></li> <li>• <b>Programme Regulations</b> This programme adheres to the College Common Awards Scheme <a href="http://www.bbk.ac.uk/registry/policies/regulations">http://www.bbk.ac.uk/registry/policies/regulations</a></li> <li>• <b>Programme Specific Regulations (or not applicable)</b> N/A</li> </ul>

21	<b>Student Attendance Framework – in brief</b>
	<p>The full version of the 'Student Attendance Framework' is available <a href="http://www.bbk.ac.uk/mybirkbeck/services/rules/Attendance-Framework.pdf">http://www.bbk.ac.uk/mybirkbeck/services/rules/Attendance-Framework.pdf</a> .</p> <p><b>Principle</b> Consistent and regular student attendance in class (or equivalent) promotes and affords student success. Inconsistent and irregular attendance is less likely to result in student success and is consistent with lower marks and degree classifications being achieved and awarded.</p> <p><b>Attendance expectation</b> Birkbeck, University of London expects you to consistently attend all timetabled sessions, including lectures, seminars, group and individual tutorials, learning support sessions, workshops, laboratories, field trips, inductions and demonstrations.</p> <p><b>E-Registers</b> All Birkbeck students are issued with student cards. Students are expected to take them to classes and to assessment venues and to present them to a member of staff if requested. This is for the purpose of identifying Birkbeck students.</p>



22	<b>Student Support and Guidance</b>
	All Birkbeck students have access to a range of student support services, details can be found on our website here: <a href="http://www.bbk.ac.uk/mybirkbeck/services/facilities">http://www.bbk.ac.uk/mybirkbeck/services/facilities</a>

23	<b>Methods of Enhancing Quality and Standards</b>
	<p>The College has rigorous procedures in place for the monitoring and enhancing its educational provision. This includes regular monitoring of programmes drawing on feedback from various sources including external examiner's reports, student feedback, student achievement and progression data. In addition, departments are reviewed every four to five years through the internal review process that includes external input.</p> <p>For more information please see the Academic Standards and Quality website <a href="http://www.bbk.ac.uk/registry/about-us/operations-and-quality">http://www.bbk.ac.uk/registry/about-us/operations-and-quality</a> .</p>

24	<b>Programme Director</b>	Dr Shino Shiode
25	<b>Start Date (<i>term/year</i>)</b>	October 2007
26	<b>Date approved by TQEC</b>	Spring 2007
27	<b>Date approved by Academic Board</b>	Summer 2007
28	<b>Date(s) updated/amended</b>	August 2020 (for 2020/21)