PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	BSc (Hons)
4	**Programme Title**	Geographic Information Science Geographic Information Science with Year in Industry
5	**UCAS/Programme Code**	F862 (BSc GIS) F867 1634U
6	**Programme Accreditation**	F862 Royal Institution of Chartered Surveyors Chartered Institution of Civil Engineering Surveyors
7	**QAA Subject Benchmark(s)**	Engineering, Computing, Geography
8	**FHEQ Level**	Level 6
9	**Date written/revised**	May 2025

10 Programme Aims

1. to address aspects of measuring, mapping, recording and managing information about an area which may be urban or rural, mountainous, coastal or on the open sea, and may range in size from a land parcel to a continent
2. to produce graduates with a sound knowledge and understanding of the management of map and map-related data and the presentation of this to map users
3. to equip graduates with the ability to undertake, manage and develop projects involving engineering surveying, geodesy, photogrammetry, cartography, GIS/LIS, hydrographic survey and computing
4. to provide a balance of rigorous vocational, scientific, technical and professional education and training in data handling and manipulation
5. to provide an in-depth research training and the opportunity to undertake an individual research project, along with an appreciation, within a research-active university School, of the nature and impact of research activity in geomatics

For students on the Careers Placement Year programme:

6. Provide students with the experience of seeking and securing a position with an employer.
7. Facilitate independent self-management and proactive interaction in a non-university setting.
8. Provide a period of practical work experience that will benefit current academic study and longer-term career plans.
9. Enable students to ethically apply their knowledge and skills in the workplace, reflect upon their development and effectively evidence and articulate their learning in relevant future settings.

11 Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the benchmark statements for Engineering, for Computing and for Geography. The mapping of intended learning outcomes onto modules is detailed in the Annex.

Knowledge and Understanding

On completing the programme students should have acquired knowledge of, and demonstrated understanding of:

A1 Fundamentals of managing, maintaining and presenting spatial data

A2 An appreciation of the concepts of accuracy and precision in spatial data handling
A3 Knowledge of the application of geographic information in addressing environmental and socio-economic issues
A4 The role of geomatics in the broad fields of environmental science, information technology and earth systems
A5 An understanding of the impact of information technology on geomatics
A6 A good grounding in the basic sciences of geography, technology and computing
A7 Management and business practices within geomatics
A8 Professional and ethical responsibilities
A9 The academic requirements of the partner professional institutions (The Royal Institution of Chartered Surveyors and the Chartered Institution of Civil Engineering Surveyors)

For students on the Careers Placement Year programme:
A10 Apply personal and professional development strategies to prioritise, plan, and manage their own skills development and learning.
A11 Research, select and apply relevant knowledge aimed at enhancing their own skills and effectiveness in specific duties at their placement.
A12 Demonstrate an understanding of a work environment, how it functions and their contribution to it.
A13 Relate their work based learning to other areas of personal development, including academic performance.

Teaching and Learning Methods

The School recognises that a variety of teaching and learning methods is necessary to achieve the intended learning outcomes. The primary mechanism for teaching knowledge and understanding is by lectures, but these are strongly supported, for most modules, by an extensive and integrated practical programme. Lectures give the students basic knowledge and understanding of all aspects from above (A1 – A9), whilst practicals strengthen understanding and application in A1 – A3, A5 and A6 in particular. Other teaching methods such as fieldwork, outside visits and lectures from visiting speakers ensure that practical applications and contemporary practice in geomatics (A4, A7 – A9) are fully covered. Students are required to be active in their learning and not merely passive recipients of information. They are also encouraged to manage their own learning through research and project-based work. An increasing emphasis is placed on team working, both in the classroom and in fieldwork and practical work. Some modules explicitly concentrate on professional and practical aspects of applied geomatics, involving discussion and seminars. Student-centred learning forms a major component of several modules. Independent reading is encouraged by the provision of reading lists for all modules. Independent research work (dependent on choice of topic) can address many of the aspects listed above.

Assessment Strategy

The larger proportion of assessment is undertaken by traditional closed-book, written examinations, although some modules are assessed by multiple-choice testing. A significant proportion of assessment is, however, continuous coursework assessment and this allows for formative development of knowledge and understanding. (A1- A9). The placement year students are expected to maintain a portfolio and write a reflective report to show their learning and skills outcomes (A10-A13).

Intellectual Skills

On completing the programme students should possess the following generic intellectual skills:

B1 Data analysis: statistical analysis; image processing and interpretation
B2 Synthesis: appropriate data modelling and integration (including data from other disciplines)
B3 Critical analysis: appraisal of data and development of argument
B4 Research skills and independent student learning
B5 Problem solving

Teaching and Learning Methods

The emphasis in this course on accurate data handling and rigorous data manipulation ensure that students quickly acquire general cognitive skills enabling them to correctly and effectively manage spatial data. Hands-on exercises promote effective data analysis and develop critical skills (B1, B3). The integration of data from numerous sources, and the implications of such integration, are also covered in detail (B2). Courses on research methods and practical research exercises ensure generic skills in research and problem solving are also taught in each Stage of the programme (B4, B5). There is an emphasis on teaching skills for independent learning.
Students are constantly exposed to practical work and spatial data handling. They learn through supervision, experience, discussion and consideration of case studies that data handling skills are essential for a professional geomatician. The major research project also presents an environment within which students learn a great deal about generic cognitive skills.

Assessment Strategy

The cognitive skills listed above are assessed particularly in the final year research project, but other coursework submissions which detail practical work undertaken also need to show evidence of cognitive skills(B 1- B5).
Students are required to work collaboratively in teams on applied projects, such as those undertaken during the field course. These projects are designed to enable students to apply their skills and knowledge to real-world scenarios, engaging in problem-solving within authentic settings. This approach supports the development of learning outcomes (B1 to B5).
In addition, the individual dissertation provides an opportunity for students to consolidate and apply their learning through an in-depth research project. This allows for critical analysis, problem-solving, and the selection and application of appropriate methods and techniques, further reinforcing outcomes (B1 to B5).

Practical Skills

On completing the programme students should be able to demonstrate the following subject-specific skills:

C1 Field skills: planning; observation; recording and processing …
C2 Programming skills: office based problem solving using IT
C3 Experimental design: hypothesis testing; use of equipment, hardware and software; assessment of results
C4 Project management for geomatics

Teaching and Learning Methods

Field skills (C1) are developed through extensive outdoor practical sessions and residential field courses. These also ensure that experimental and project management skills (C3, C4) are also introduced and taught. Other practical skills, including programming (C2), are taught in lectures and indoor and laboratory practical sessions.
All the skills listed above are introduced progressively throughout the three-year degree programme such that considerable independence in the application of these skills is achieved by the end of the degree programme.

Assessment Strategy

Examinations assess many of the skills listed above, but it is the hands-on practical experience and the subsequent coursework which yields the major summative assessment of these skills. Major residential fieldcourses form two discrete modules, in Stage 1 and at the beginning of Stage 3, whose results (both individual and team) are assessed (C1). Programming skills (C2) are similarly assessed through examination and coursework submission in specific modules. Project management (C4) is assessed in the Professional Practice module. Experimental design is assessed during field related project work, such as the field course to replicate a real world scenario (C3)

Transferable/Key Skills

On completing the programme students should have attained the following core skills:

D1 Communication: written, oral and interpersonal at a level appropriate for the target audience
D2 Teamwork: coordination, leadership and resolving conflicts both in the field and in the laboratory
D3 Planning and organisation: setting objectives; allocating resources; time management
D4 Initiative and adaptability: responding to change; working independently
D5 Numeracy: understanding and using numbers and mathematics correctly
D6 Literacy: ability to read critically and with purpose
D7 IT: effective use of a wide range of computing technology
D8 Record and reflect on technical and transferable graduate skills towards professional qualification

For students on the Careers Placement Year programme:
D9 Reflect on and manage own learning and development within the workplace.
D10 Use existing and new knowledge to enhance personal performance in a workplace environment, evaluate the impact and communicate this process.
D11 Use graduate skills in a professional manner in a workplace environment, evaluate the impact and communicate the personal development that has taken place.

Teaching and Learning Methods

Many of these skills are taught, practised and assessed in a large number of modules. The 'key skills' matrix published in the student handbook demonstrates that, at every Stage in the degree programme, a significant range of core skills are taught, in formal modules and during induction week.

Written and oral presentation skills (D1) are taught explicitly in the Stage 2 Research Methods module. Teamwork (D2) is a particular strength of this degree programme and is taught both on residential fieldcourses and in other modules where students undertake practical exercises (indoor and outdoor) in teams. Planning and organisation skills (D3) are regarded as generic and are taught specifically in research methods and professional practice modules. Techniques of initiative and adaptability (D4) are similarly addressed in the professional practice and management modules. Numeracy (D5) is specifically addressed in a range of basic and additional maths modules; Literacy (D6) is encouraged with the incorporation of reading lists into every module outline form; and IT use (D7) is taught in the vast majority of modules which rely upon digital equipment, software packages and student-written programs. The Year in Industry placement in particular, provides students with the opportunity to develop and record professional skills in the context of the workplace (D8).

Students learn about these key skills in a number of ways: they are practised in specific modules as detailed on the 'key skills' matrix published in the student handbook, and we would particularly highlight the role of communication, problem solving, teamwork and IT skills which the students are exposed to.

Assessment Strategy

Key skills are assessed through the summative marking of a range of pieces of work, including fieldcourse reports, oral presentations, major research project submission, abstracting exercises, library and information search coursework, presentations on professional issues. The 'key skills' matrix published in the student handbook indicates the modules where these skills are explicitly assessed, but it should be noted that all coursework submission, and a significant amount of formal examination assessment, will take competence in key skills into account.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

This is a three year full-time modular programme consisting of 120 credits per year for three years. Using university conventions, 10 credits are equivalent to 100 hours of study time (all contact hours plus private study). Students are expected to take 60 credits in each semester (half teaching year), although imbalances are permitted. Modules offered by the school can be worth 10, 20 or 30 credits, although it is possible for students on this degree programme to take some modules from outside the School: these may have credit weights which vary from this.

Stages 2 and 3 offer a range of compulsory and some optional modules which allow for specialisation in the areas of digital data use and spatial data analysis. There are opportunities to follow modules which deal with other aspects of geomatics in an integrated manner: modules in areas such as survey data processing, GPS and navigation, engineering aspects and geophysics can be taken thus ensuring a wide

view of the whole discipline. Through optional module choice, students have an opportunity to expand their knowledge of non-geomatics subjects, notably in computer science.

Students on the Careers Placement Year programme will take their placement in the penultimate year of studies.

Many Stage 3 modules have Stage 2 pre-requisites, but it is possible to take some optional modules from the Stage 2 programme during Stage 3. Both Stages are equally weighted in the determination of the final degree classification. Progress from Stage 2 to Stage 3 requires all modules taken in the second year to be passed. However, at the end of Stage 2, re-sits for failed modules are possible and further failure of any module can be 'compensated' up to a maximum of 40 credits.
Stage 3 also includes a substantial 30 credit compulsory research project, to which students have been introduced through the compulsory research methods module in Stage 2. The project requires advanced knowledge and understanding and promotes the acquisition, use and assessment of many cognitive and key skills. In addition, further residential field trips are organised, for Stage 2 students during the Easter vacation, and for Stage 3 students during and immediately after Induction Week.

Key features of the programme (including what makes the programme distinctive)

Particular features of the degree programme include:

- tion and training
- Significant fieldwork opportunities
- Considerable exposure to advanced contemporary digital technology
- An in-depth research training and the opportunity to undertake an individual research project
- An appreciation, within a research-active university School, of the nature and impact of research activity in geomatics
- A full range of professional and management modules
- Range of specialist GIS and programming modules
- The fostering of an *esprit de corps* through team-building exercises, group work in practicals, the small and friendly nature of the geomatics part of the School and the existence of social (student CEG Society) and formal (Staff Student Committee) avenues of interaction; in addition to the operation of a 'buddy' system for incoming students
- The opportunity, through visiting speakers and strong links with the mapping and GIS industry, to gain an understanding of the nature, scope and impact of contemporary British and international commerce and enterprise within the discipline.
- All students have the opportunity to undertake a Year in Industry if they can secure a placement and demonstrate suitable performance and motivation by the end of Stage 1, which is again reviewed at the end of Stage 2. In addition to independent search and utilisation of the resources available through the University Careers Service, our Industrial Liaison Officer will support interested students in their efforts to secure a placement. Some students will therefore transfer between programmes with and without Year in Industry.

Programme regulations (link to on-line version)

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13 Support for Student Learning

Generic information regarding university provision is available at the following link.
Generic Information

14 Methods for evaluating and improving the quality and standards of teaching and learning

Generic information regarding University provision is available at the following link.

Generic Information

Accreditation reports – F862 only
Accreditation is important for this degree programme and visits by the accrediting institutions are regular (annually). In addition, annual returns are made to one of the accrediting bodies (RICS) in respect of entry qualifications, student body composition and final employment destinations, for each year's cohort. Further, an external examiner is appointed by RICS, who has an active and equal role to the academic external examiner in the assessment process. It is anticipated that the "Year in Industry" programme will become accredited by RICS.

The aim of all evaluation and accreditation is to continually ensure that the programme achieves its stated aims, meets the national Benchmarking Statements for the discipline and produces graduates in line with developments in the subject and the changing needs of employers.

15 Regulation of assessment

Generic information regarding University provision is available at the following link.
Generic Information

In addition, information relating to the programme is provided in:

The University Prospectus: http://www.ncl.ac.uk/undergraduate/degrees/#subject
Degree Programme and University Regulations: University Regulations | University Regulations | Newcastle University

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided.