PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	BSc (Hons)
4	**Programme Title**	Surveying and Mapping Science (Component)
5	**UCAS/Programme Code**	HF28 (Surveying and Mapping Science and Geography) (Withdrawn to new students, Stage 3 students only).
6	**Programme Accreditation**	The Royal Institution of Chartered Surveyors The Institution of Civil Engineering Surveyors
7	**QAA Subject Benchmark(s)**	Engineering
8	**FHEQ Level**	Honours
9	**Date written/revised**	September 2007

10 Programme Aims

This 50% component of a Joint Honours undergraduate degree programme, which is firmly established within the Faculty of Science, Agriculture and Engineering aims to produce graduates with a sound knowledge and understanding of spatial data collection, analysis, management and presentation. The programmes cover 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. Due to the range of optional modules available, graduates will not address each element of the discipline of geomatics. Graduates are able, dependent on module choice, to establish, undertake, manage and develop projects involving engineering surveying, geodesy, photogrammetry, cartography, GIS/LIS, hydrographic survey and computing and thereby follow a wide choice of professional careers within geomatics. Alternatively they may apply their skills in a range of other careers.

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.

Knowledge and Understanding

On completing the programme students should:

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 spatial data in navigation, environmental monitoring and thematic mapping;
A4 The role of geomatics in the broad fields of engineering, applied science and technology;
A5 A good grounding in the basic sciences of mathematics, computing and physics;
A6 Management and business practices within geomatics;
A7 Professional and ethical responsibilities;
A8 The academic requirements of the partner professional institutions (The Royal Institution of Chartered Surveyors and the Institution of Civil Engineering Surveyors).

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 – A8), whilst practicals strengthen understanding and application in A1 – A3, and A5 in particular. Other teaching methods include teamwork exercises in the field.

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 practical work. Some modules explicitly concentrate on professional and practical aspects of applied geomatics, involving discussion and seminars. Independent reading is encouraged by the provision of reading lists for all modules. Optional module choices can extend the student experience to include independent research work and residential fieldwork.

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.

Intellectual Skills

On completing the programme students should be able to perform:

B1 Data analysis: statistical analysis; image processing and interpretation; application of mathematical techniques to data analysis;
B2 Synthesis: appropriate data modelling and integration (including data from other disciplines);
B3 Critical analysis: appraisal of data and development of argument;
B4 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 intellectual 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). There is an emphasis on teaching skills for independent learning and for practical problem solving (B4).

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.

Assessment Strategy

The intellectual skills listed above are assessed particularly in coursework submissions which detail practical work undertaken.

Practical Skills

On completing the programme students should have developed:

C1 Field skills: planning; observation; recording and processing; application of scientific principles in the field;
C2 Experimental design: hypothesis testing; use of equipment, hardware and software; assessment of results.

Teaching and Learning Methods

Field skills (C1) are developed through extensive outdoor practical sessions and optional residential field courses. These also ensure that experimental skills (C2) are also introduced and taught. Other practical skills taught can include programming.

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.

Transferable/Key Skills

On completing the programme students should have developed skills in:

D1 Communication: written, oral and interpersonal at a level appropriate for the target audience;
D2 Teamwork: 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.

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 tutorial elements of Stage 1 modules. Teamwork (D2) is a particular strength of this degree programme and is taught both on optional residential field courses and in other modules where students undertake practical exercises (indoor and outdoor) in teams. Both planning and organisation skills (D3) and initiative and adaptability (D4) are regarded as generic and are taught specifically in the professional practice module. Numeracy (D5) is specifically addressed in a range of basic 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.

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. Good study habits are engendered from the beginning of Stage 1, as induction week programmes (including a compulsory management skills session) address all these elements.

Assessment Strategy

Key skills are assessed through the summative marking of a range of pieces of work, including practical reports. The 'key skills' matrix published in the student handbook indicates the modules where these and other 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 component is 50% of a three year full-time modular programme and therefore consists of 60 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 30 credits in this component in each semester (half teaching year), although imbalances are permitted. Modules offered by the school can be worth 10 or 20 credits.

The compulsory and optional modules at Stage 1 give a firm foundation across the subject matter of geomatics. A full understanding of the integration of mathematics and computing science with the tasks of precise spatial data recording and presentation, map and image handling and accurate measurement is achieved. Practical work, seminars, a management skills course and the introduction of IT into most modules give students an in-depth appreciation of the nature of the subject and the methods by which it is taught.

Progress from Stage 1 to Stage 2 is dependent on passing all modules: modules can be re-sat and can be passed by compensation up to a maximum of 40 credits in total for both components. University regulations govern issues such as number of attempts at re-sit assessment and the time period within which degree courses can be taken.

A student, who passes all core modules but fails up to 20 credits of non-core modules, may proceed as of right to the next stage of the programme. In such circumstances, a student will follow the normal pattern of study and assessment for the subsequent stage, in addition to being reassessed in the failed modules.

Stages 2 and 3 offer a range of compulsory and 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. Dependent on pre-requisites, these can be chosen from all areas of the discipline including surveying, mathematical support, photogrammetry and image handling, geodesy, cartography, and GIS.

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, and also to take a limited number of Stage 1 modules in Stage 2 (purely for pre-requisite purposes). Both Stages 2 and 3 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 30 credits in total over both components of the whole degree programme.

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

Particular features of the degree programme include:

- Choice of some modules at Stage 1 (dependent on mathematics ability)
- A balance of vocational, scientific and professional education and training
- Significant fieldwork opportunities
- Considerable exposure to advanced contemporary digital technology
- An appreciation, within a relatively small but research-active university school, of the nature and impact of research activity in geomatics
- A range of professional and management modules
- The fostering of an *esprit de corps* through team-building exercises, group work in practicals, the small and friendly nature of the school and the existence of social (student Surveying Society) and formal (Staff Student Committee) avenues of interaction.

Programme regulations (link to on-line version)

HF28: http://www.ncl.ac.uk/regulations/programme/2007-2008/programme/hf28.php

13 Criteria for admission

Dealt with in overarching Joint Honours Programme Specification.

14 Support for Student Learning

Induction
During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/ tutorials/etc. The International Office offers an additional induction programme for overseas students (see http://www.ncl.ac.uk/international/coming_to_newcastle/orientation.phtml)

Study skills support
Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Academic support
The initial point of contact for a student is with a lecturer or module leader, or their tutor (see below) for more generic issues. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Staff-Student Committee, and/or at the Board of Studies.

Pastoral support
All students are assigned a personal tutor whose responsibility is to monitor the academic performance and overall well-being of their tutees. Details of the personal tutor system can be found at http://www.ncl.ac.uk/undergraduate/support/tutor.phtml
In addition the University offers a range of support services, including the Student Advice Centre, the Counselling and Wellbeing team, the Mature Student Support Officer, and a Childcare Support Officer, see http://www.ncl.ac.uk/undergraduate/support/welfare.phtml

Support for students with disabilities
The University's Disability Support Service provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies. For further details see http://www.ncl.ac.uk/disability-support/

Learning resources
The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide computing facilities, see
http://www.ncl.ac.uk/undergraduate/support/acfacilities.phtml

All new students whose first language is not English are required to take an English Language test in the Language Centre. Where appropriate, in-sessional language training can be provided. The Language Centre houses a range of resources for learning other languages which may be particularly appropriate for those interested in an Erasmus exchange. See http://www.ncl.ac.uk/undergraduate/support/facilities/langcen.phtml

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

Module reviews
All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the School Teaching and Learning Committee and at the Board of Studies. Student opinion is sought at the Staff-Student Committee and/or the Board of Studies. New modules and major changes

to existing modules are subject to approval by the Faculty Teaching and Learning Committee.

Programme reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Teaching and Learning Committee.

External Examiner reports
External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Teaching and Learning Committee. External Examiner reports are shared with institutional student representatives, through the Staff-Student Committee.

Student evaluations
All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Staff-Student Committee, and the Board of Studies. The National Student Survey is sent out every year to final-year undergraduate students, and consists of a set of questions seeking the students' views on the quality of the learning and teaching in their HEIs. Further information is at www.thestudentsurvey.com/ With reference to the outcomes of the NSS and institutional student satisfaction surveys actions are taken at all appropriate levels by the institution.

Mechanisms for gaining student feedback
Feedback is channelled via the Staff-Student Committee and the Board of Studies.

Faculty and University Review Mechanisms
The programme is subject to the University's Internal Subject Review process, see http://www.ncl.ac.uk/aqss/qsh/internal_subject_review/index.php

Accreditation reports

Additional mechanisms

Review Mechanisms:

Student Questionnaires
Degree Programme Review
Internal Subject Review
QAA Academic Review

Committees For Monitoring Quality

Faculty Board for Co- and Multi-disciplinary Degree Programmes
Co- and Multi-disciplinary Staff-Student Committee
Awards Board for Co- and Multi-Disciplinary Degree programmes
Subject Area Boards of Studies
Subject Area Boards of Examiners
Subject Area Staff-Student Committees
Faculty Teaching and Learning Committee
University Teaching and Learning Committee

16 Regulation of assessment

Pass mark
The pass mark is 40 (Undergraduate programmes)

Course requirements
Progression is subject to the University's Undergraduate Progress Regulations (http://www.ncl.ac.uk/calendar/university.regs/ugcont.pdf) and Undergraduate Examination Conventions (http://www.ncl.ac.uk/calendar/university.regs/ugexamconv.pdf). In summary,

students must pass, or be deemed to have passed, 120 credits at each Stage. Limited compensation up to 40 credits and down to a mark of 35 is possible at each Stage and there are resit opportunities, with certain restrictions.

Weighting of stages
The marks from Stages 2 and 3 will contribute to the final classification of the degree
The weighting of marks contributing to the degree for Stages 2 and 3 is 1:1.

Common Marking Scheme
The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions, namely

	Honours	**Non-honours**
<40	Fail	Failing
40-49	Third Class	Basic
50-59	Second Class, Second Division	Good
60-69	Second Class, First Division	Very Good
70+	First Class	Excellent

Role of the External Examiner
An External Examiner, a distinguished member of the subject community, is appointed by Faculty Teaching and Learning Committee, after recommendation from the Board of Studies. The External Examiner is expected to:

- See and approve examination papers
- Moderate examination and coursework marking
- Attend the Board of Examiners
- Report to the University on the standards of the programme

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

The University Prospectus (see http://www.ncl.ac.uk/undergraduate/)

The School Brochure (contact enquiries@ncl.ac.uk)

The University Regulations (see http://www.ncl.ac.uk/calendar/university.regs/)

The Degree Programme Handbook

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. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

Annex

Mapping of Intended Learning Outcomes onto Curriculum/Modules

Intended Learning Outcome	Module codes (Comp/Core in Bold)
A1	SVY1002, SVY1001, SVY1006, SVY2002, SVY2004, SVY2006, SVY2007, SVY3001, SVY3010, SVY3006
A2	SVY1002, SVY1001, SVY1005, SVY1006, SVY2010, SVY2002, SVY2003, SVY2004, SVY2006, SVY2007, SVY3001, SVY3007, SVY3010, SVY3005, SVY3006, SVY3008
A3	SVY1002, SVY1001, SVY1005, SVY1006, SVY2010, SVY2002, SVY2003, SVY2004, SVY2006, LAW2053, SVY3001, SVY3002, SVY3007, SVY3010, SVY3005, SVY3006, SVY3008
A4	SVY1002, SVY1005, SVY1006, SVY2010, SVY2002, SVY2003, SVY2004, SVY2005, SVY2006, ENG2001, SVY3001, SVY3002, SVY3007, SVY3010, SVY3005, SVY3006, SVY3008
A5	SVY2010, SVY2011, SVY2005, SVY2007
A6	LAW2053, ENG2001, SVY3002,
A7	ENG2001, SVY3095
A8	The academic requirements of the partner professional institutions (The Royal Institution of Chartered Surveyors and the Institution of Civil Engineering Surveyors) These areas of knowledge and understanding encompass the vast majority of the syllabus and are therefore introduced, practised and assessed in all the modules within the degree programmes: they are therefore not detailed here.
B1	Field skills • planning • observation • recording and processing • application of scientific principles in the field SVY1001, SVY2003, SVY3010, SVY3008
B2	Experimental design • hypothesis testing • use of equipment, hardware and software • assessment of results SVY1002, SVY1001, SVY1005, SVY2010, SVY2011, SVY2002, SVY2003, SVY2004, SVY2005, SVY2006, SVY2007, SVY3001, SVY3007, SVY3010, SVY3005, SVY3006, SVY3095, SVY3008,
C1	Data analysis • statistical analysis

	• image processing and interpretation • application of mathematical techniques to data analysis SVY1002, SVY1001, SVY1005, SVY1006, SVY2010, SVY2011, SVY2003, SVY2006, SVY2007, SVY3007, SVY3010, SVY3005, SVY3006
C2	Synthesis • appropriate data modelling • appropriate data integration SVY1002, SVY1001, SVY1005, SVY1006, SVY2010, SVY2002, SVY2003, SVY2004, SVY2006, SVY2007, SVY3001, SVY3002, SVY3007, SVY3010, SVY3005, SVY3095, SVY3008
C3	Critical analysis • appraisal of data • development of argument SVY1002, SVY1001, SVY1005, SVY1006, SVY2010, SVY2002, SVY2003, SVY2004, SVY2006, LAW2053, ENG2001, SVY3001, SVY3002, SVY3007, SVY3010, SVY3095
C4	Problem Solving SVY1002, SVY1001, SVY1005, SVY1006, SVY2011, SVY2002, SVY2005, LAW2053, SVY3002, SVY3007, SVY3006, SVY3095, SVY3008,
D1	Communication • written (w) • oral (o) • interpersonal (w)SVY1002, (w)SVY1001, (w)SVY1005, (w)SVY1006, (w)SVY2010, (w)SVY2002, (w)SVY2003, (w)SVY2004, (w)SVY2005, (w)SVY2006, (w)SVY3007, (w)SVY3006, (w)SVY3095, (w)SVY3008, (o)SVY1002, (o)SVY1001, (o)SVY1005, (o)SVY1006, (o)SVY2004, (o)SVY2006, (o)SVY2007, (o)LAW2053, (o)SVY3002, (o)SVY3007, (o)SVY3005, (o)SVY3095 Interpersonal communication skills are introduced, practised and assessed in the vast majority of modules within the degree programmes.
D2	Teamwork • coordination • resolving conflicts • leadership SVY1002, SVY1001, SVY2003, SVY2004, SVY3007, SVY3010,
D3	Planning and Organising • setting objectives • allocating resources • time management SVY1001 Stage 2 INDUCTION, SVY2010, SVY2002, SVY2004, ENG2001 Stage 3 INDUCTION,SVY3001, SVY3010, SVY3095

D4	Initiative and adaptability • responding to change • working independently SVY1001, SVY1005, SVY3010, SVY3095