Programme Specification

A statement of the knowledge, understanding and skills that underpin a taught programme of study leading to an award from The University of Sheffield

1	**Programme Title**	Polar and Alpine Change
2	**Programme Code**	GEOT132 (Full-time) GEOT133 (Part-time)
3	**JACS Code**	F780, F760, F842
4	**Level of Study**	Postgraduate
5a	**Final Qualification**	MSc (Res)
5b	**QAA FHEQ Level**	7
6a	**Intermediate Qualification(s)**	None
6b	**QAA FHEQ Level**	Not applicable
7	**Teaching Institution** (if not Sheffield)	Not applicable
8	**Faculty**	Social Sciences
9	**Department**	Geography
10	**Other Departments providing credit bearing modules for the programme**	None
11	**Mode(s) of Attendance**	Full-time or Part-time
12	**Duration of the Programme**	1 year or 2 years
13	**Accrediting Professional or Statutory Body**	Not applicable
14	**Date of production/revision**	September 2015, Revised January 2019

15. Background to the programme and subject area

This one-year Masters of Research (MSc (Res)) programme is a springboard for a research career within the subject area of cold-regions science, notably in the disciplines of glaciology, glacial geomorphology, polar climatology and environmental science. Its underlying theme is rapid changes in these regions' climates and environments. The programme targets those wishing to acquire research experience and skills before progressing to a PhD, and is founded on the expertise of the group of *Ice and Climate Researchers* (ICERS) in the Department of Geography (http://www.sheffield.ac.uk/geography/research). Key training is delivered via a substantial Research Project that the student carries out with regular supervision. The research can be field-, laboratory- or desk-based or a combination, and lasts through the year. Besides initial training on Research Design, where the student proposes the research project, an exciting feature of the programme is the Field Course module visiting an arctic or alpine destination. This Field Course nominally runs for 4-5 weeks during summer, teaches field skills in a unique environment and exposes the student to its scientific agendas. The field-course visit may allow access to suitable sites for the student's research project also. We believe that the strong research and fieldwork component of this programme offers the best combination of Masters-level training that prepares the student to pursue a research career in the subject area.

16. Programme aims

Our aims within the programme are as follows:

1. To provide advanced training and experience in scientific research that explores the changing climates and environments of polar and alpine regions and their processes, expressions and implications.
2. To provide training in generic research skills including project design and management and oral and written communication.
3. To develop specialised, substantive research knowledge of a field within the broad subject area of cold-regions science.

4. To provide skills training and experience in fieldwork research in polar/alpine destinations.
5. To develop scientific rigour, independent thinking and a critical approach to scholarship.
6. To prepare students for a career in geoscientific research, and produce graduates that are highly competitive for PhD positions within the broad subject area of cold-regions science.

17. Programme learning outcomes

Knowledge and understanding:	
K1	Advanced knowledge of at least one research area within the broad subject of cold-regions science, including its theoretical and observational foundations, information base, methods and technology, and recent developments.
K2	Knowledge of how to design and formulate a research proposal and how to undertake a research project.
K3	Knowledge of how scientific findings are analysed to reach conclusions, and understanding of the challenges involved in developing a robust piece of research.
K4	Key field methods used to study climatic, glaciological, sedimentary and biogeochemical systems in polar and alpine environments, and knowledge of ongoing changes in one such environment.

Skills and other attributes. Graduating students will have an ability to:	
S1	Plan, design and execute an independent piece of research, including producing its final report; show critical understanding of the corresponding methodology; frame scientific results in appropriate context.
S2	Describe and explain key observations and theories and thinking and development of a research area.
S3	Engage with a range of scientific research strategies and the developing technologies associated with these strategies.
S4	Critique information reported in the literature and research seminars, identify gaps in current knowledge, and suggest new research problems.
S5	Investigate polar and alpine environments by collecting, combining and interpreting different types of evidence, and apply appropriate methods (e.g. field, laboratory and quantitative) in these activities.
S6	Plan, design and carry out original, group-based field studies of polar and alpine environments.
S7	Conduct discussion and oral presentation of scientific findings.

18. Teaching, learning and assessment

Development of the learning outcomes is promoted through the following teaching and learning methods

	Teaching and Learning							Assessment Methods				
Learning Outcome (in Sec. 17)	Lectures	Seminars	Research Supervision	Oral Presentations of research	Individual Research	Attendance of dept. seminars (GEO6612)	Field & lab work on Field	Case study of researcher approaches	"Current Issues" (GEO6612)	Field-Course essay	Research project	Final report of research
K1	√	√	√		√	√	√		√	√	√	√
K2	√	√	√	√	√			√			√	√
K3	√	√	√	√	√	√	√	√	√	√	√	√
K4			√		(√)	(√)	√			√	(√)	(√)
S1			√	√	√						√	√
S2	√	√	√	√	√	√		√	√	√	√	√
S3	√	√			√		√	√		√	√	√
S4		√	√	√	√	√			√		√	√
S5			√		√		√			√		√
S6							√			√		
S7			√	√	√	√	(√)	√	√	(√)		√

In the Research Project (GEO6669), each student is allocated a supervisor or supervisory team. Knowledge acquisition and method of assessment are modelled on those in PhD training. The student develops and applies research, methodological and writing skills by independently designing and conducting a theoretically-informed geoscientific study. The student gains understanding and experience through direct engagement with the research problems in the study, under supervisory guidance. Key activities include bibliographic searches, use of qualitative and/or quantitative research techniques, data collection, analysis and interpretation, discussion with supervisor, oral presentation of mid-project findings in a mini symposium, and poster presentation of final project findings.

The Field Course (GEO6613) delivers small-group teaching of both theory and practical techniques and is aimed at giving students hands-on field experience in a polar/alpine environment.

In the Research Design module (GEO6602), students learn different approaches of doing research in climatic/ environmental/geo- science and formulate the proposal of their own Research Project (to be carried out in GEO6669) and present their proposal orally.

In the "Current Issues" module (GEO6612), students attend departmental research seminars given by outside speakers and, after reading the corresponding literature, discuss each speaker's presentation and the current status of knowledge and key developments in the corresponding research area, in sessions led by the module convenor. By attending these GEO6612 seminars and sessions and producing the "Case Study of Researcher Approaches" in GEO6602, the students gain knowledge of research trends and priorities and learn multiple examples of the conceptualisation, execution and presentation of research, which aid their own conception of the research project.

Opportunities to demonstrate achievement of the learning outcomes are provided through the following assessment methods:

A **case-study report** (30% of the mark in GEO6602) that profiles the scientific approaches of an established researcher tests the student's understanding of K2 and K3 from the position of evaluating research conducted by other people.

The **research proposal** (70% of GEO6602) tests the student's understanding of K1 and K2 and ability to anticipate K3 during early stage of the research project when some pilot investigations have been done.

The **presentation** and **essay** in the "Current Issues" module (33% + 67% respectively, in GEO6612) require the students to produce oral and written critiques of a research area/topic that stem from discussions around departmental research seminars given by scientists outside the University of Sheffield (TUOS), and test K1 and K3.

In the Research Project, an assessed **oral presentation** (10% of GEO6669) and an assessed poster presentation (another 10% of GEO6669) will allow students to demonstrate attainments in K2 and K3.

The **final report of research project** (80% of GEO6669) is written in the style of a scientific journal article and allows the student to show achievements in K1 to K3, and in K4 if the project involves fieldwork.

In the Field Course (GEO6613), the student submits a **field-course project report** of group-based field (including any laboratory) studies, which tests K3 and K4, and an **essay**, which tests K1 and some of K4.

19. Reference points

The learning outcomes have been developed to reflect the following points of reference:

- University's Learning, Teaching and Assessment Strategy.
- NERC guidelines on MSc course recognition.
- Research of staff in the Department, specifically the group undertaking Ice and Climate Research (ICERS).
- The Framework for Higher Education Qualifications.
- The Department's Learning and Teaching Strategy.
- Aim of attracting and retaining top-quality research-oriented BSc graduates, and nurturing able researchers, for enhancing PhD recruitment within the Department.
- Further consolidation of our research and teaching links with The University Centre in Svalbard and of access to the adjacent arctic environment for research and teaching.

20. Programme structure and regulations

The programme is offered in full-time and part-time study modes. In both modes, a student will take four units totalling 180 credits of study:

CORE

GEO6602 Research Design in Analysis of Environmental Systems (15 credits)

GEO6612 Current Issues in Polar and Alpine Science (15 credits)

GEO6669 Polar and Alpine Change Research Project (135 credits)

GEO6613 Artic/Alpine Field Course (15 credits)

21. Student development over the course of study

The chief aim of the programme is research training with rigour and intensity approaching that of PhD programmes but with short (1-year) duration. Generally, in the research project, the student acquires specialist knowledge and necessary skills in laboratory, field and quantitative research by carrying out different phases of the work - through independent learning, absorbing and applying information from relevant literature, and direct observation/experimentation (data, laboratory or modelling analyses, or fieldwork). As in PhD programmes, this development is essentially continuous and guided by regular supervision, and some skills are taught directly by

the supervisor and other experts in the Department's research group.

Identification of research topic
In Semester 1, the Research Design (GEO6602) and Current Issues (GEO6612) modules expose students to different research approaches of established scientists. Together with pilot research undertaken in GEO6669, this experience aids the students' selection of their research topics. As in the GEOT130 programme, a "list of staff-suggested project ideas" is disseminated in Week 1 to help students conceive projects, and confirmation of their project ideas and allocation of supervisor(s) happens around Week 6/7. Regular supervision takes place from then onward. Together with ongoing pilot research, this process leads students toward writing and submission of their full-fledged GEO6602 research proposal, which is submitted after the Christmas Vacation.

Execution of research (GEO6669)
Pilot phase: Through Semester 1, and starting as early as from Week 3/4, the student undertakes pilot research (as part of GEO6669) to aid formulating their project idea, identify conceptual/technical hurdles associated with their project, and stabilise its scope and key strands. This work typically involves literature review, learning/ applying some methods and testing/developing key methodology. As described above, these activities fuel the GEO6602 proposal. This proposal needs to gain a 'pass' for the student to continue to next phase.

Main phase: This takes place after the Christmas Vacation and throughout Semester 2 and the summer. Besides attending regular 1-to-1 supervision, students give two oral presentations, a first one at the end of Jan/early Feb on their proposed research (as part of GEO6602), and a second in late Semester 2 reporting their research findings-to-date in a "mini-conference". The second presentation is assessed (10% of GEO6669). Both presentations are formative in the student's development of research project and oblige the student to perform in front of an academic audience. Each talk is followed by Q&A and assigned a researcher who issues feedback to the student afterwards. The submission deadline of the final Project Report is around mid-September.

Pastoral elements
Students are supported in Semesters 1 and 2 through four 1-to-1 meetings with the Programme Director, who acts as Personal Tutor to advise on academic/welfare matters, application for PhD positions and any issues concerning research supervision and progress. The Programme Convenor also runs a session on "How to apply for PhD?" early on in Semester 1.

More generally, students are embedded in the community of *Ice and Climate Researchers* (ICERS) in the Department alongside PhD students, post-doctoral researchers and staff. They attend Departmental Research Seminars and some research gatherings. Through these interactions, the students gain more insights into the scientific profession, at the same time contributing to research scholarship and atmosphere of the community.

22. Criteria for admission to the programme

1. A minimum of a good Upper Second- Class honours degree showing First-Class potential (notably in research) from a UK University (or an international equivalent) in relevant subject areas including (but not restricted to) Physical Geography, Environmental / Earth / Ocean Sciences, Geology, Physics, and Natural Science.

2. Evidence of engagement with and aptitude in geoscientific research.

Candidates holding other qualifications will be considered on an individual basis. International students are required to attain IELTS 7.0 overall with at least **6.5** in each component. The high entrance requirements here are chosen to ensure that students can tackle the level of research demanded by GEO6669, and to maintain competitiveness of our MSc(Res) graduates in the PhD market.

23. Additional information

This specification represents a concise statement about the main features of the programme and should be considered alongside other sources of information provided by the teaching department(s) and the University. In addition to programme specific information, further information about studying at The University of Sheffield can be accessed via our Student Services web site at http://www.shef.ac.uk/ssid.