Programme Specification

Applied Geographic Information Systems and Remote Sensing (2019-20)

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

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of Study	Full-time
Duration in years	1
Accreditation details	None
Final award	Master of Science (MSc)
Name of award	Applied Geographic Information Systems and Remote Sensing
Interim Exit awards	Postgraduate Certificate
	Postgraduate Diploma
FHEQ level of final award	Level 7
UCAS code	
Programme code	4541
QAA Subject Benchmark or other external reference	Earth Sciences, Environmental Sciences And Environmental Studies 2007
Programme Lead	Gareth Roberts (gjr1f10)

Programme Overview

Brief outline of the programme

The MSc in Applied Geographical Information Systems and Remote Sensing (AGISRS) has three distinctive features:

1) It focuses on '*real world*' problems by applying geospatial technology to areas such as public health, population dynamics, food security and environmental management.
2) It combines the study of two key geospatial technologies – remote sensing and geographical information systems – within a single programme.
3) The programme has a strong technical component with the option to learn up to two programming languages which is a highly sought after skill.

The programme will develop your knowledge of the subject area in order to enhance employment opportunities within the Earth Observation and GIS communities, consultancies, private and public sectors. Your contact hours will vary depending on your module/optional choices. Full information about contact hours is provided in individual module profiles.

Learning and teaching

External speakers sometimes provide additional lectures, alongside the modules that are delivered through the programme.

Assessment

A range of assessment methods are used with a majority of them consisting of individual or group coursework assignments (e.g. reports, essays, presentations, literature reviews, posters).

Special Features of the programme

Key highlights of the programme includes: (i) engagement with industry (e.g. a careers day afternoon) and (ii) potential opportunities to conduct an industry based dissertation.

Facilities

Masters students have access to Geography & Environmental Science's recently refurbished geoprocessing suite, where key software packages like ArcGIS, QGIS, Envi and ERDAS are available for use. There are also a wide range of workstation clusters throughout the Highfield campus. Students also have the opportunity to work with the Schools field spectroscopy facilities and for topographic applications, use the terrestrial laser scanners.

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our Disclaimer to see why, when and how changes may be made to a student's programme. Programmes and major changes to programmes are approved through the University's programme validation process which is described in the University's Quality handbook.

Educational Aims of the Programme

The MSc programme is an innovative inter-disciplinary learning opportunity that combines the areas of remote sensing and geographical information systems. The programme is aimed both at individuals with little prior knowledge of the subject area and those wishing to obtain a detailed understanding of the subject with the scope to specialise in topics of specific interest. Potential employment opportunities fall within the Earth Observation or Geographical Information Systems/science (GIS) communities, consultancy companies, private and public sectors (e.g. research institutions, government agencies, universities). As well as leading to careers in remote sensing/GIS, we also hope that some students remain at Southampton to undertake research for a PhD degree.

The programme has introductory GIS and remote sensing modules in the 1st semester to meet the needs of students who have limited previous experience in these areas. In the 2nd semester, the modules are more advanced and specialist. You will extend your subject specific skills and general skills through practical classes, lectures, group tutorials and self-study. You will also complete a research project on a topic at the forefront of remote sensing and/or spatial analysis. It may be possible for the project to be undertaken in association with an external organisation involved in remote sensing and spatial analysis.

The aims of the programme are to provide you with:

•   An appreciation of the principles of remote sensing and geographical information systems
•   Recognition of how the Earth's environments can be observed and measured using remote sensing devices
•   the capacity to apply image processing and geospatial software for digital image and geospatial analysis
•   Training that is multidisciplinary, through advanced coursework and an individual research project
•   Vocational training for a professional career related to remote sensing and spatial analysis by undertaking a number of specialised options
•   Industry awareness through talks from visitors.

Programme Learning Outcomes

Knowledge and Understanding

On successful completion of this programme you will have :
A1.   An appreciation of the fundamental principles of remote sensing and geographical information systems
A2.   Acquired the ability to discuss selected aspects of the subject area that allows you to synthesise the current

literature and engage in discussion with peers

A3. The ability to describe contemporary techniques used to analyse remotely sensed imagery and other geospatial data sets

A4. The capacity to identify and evaluate a range of geospatial data sources and data types

A5. The ability to demonstrate the application of the analysis methods available GIS and remote sensing software

A6. Developed transferable skills that enhance employability

A7. The capability to synthesise and critique scientific literature

A8. Critical ability, as demonstrated by the research project, which advances a specific area of research

A9. Developed the ability to conduct an independent research

On successfully gaining a **Postgraduate Certificate** you will have:

A1. An appreciation of the fundamental principles of remote sensing and geographical information systems

A3. The ability to describe contemporary techniques used to analyse remotely sensed imagery and other geospatial data sets

A5. The ability to demonstrate the application of the analysis methods available GIS and remote sensing software

A6. Developed transferable skills that enhance employability

On successfully gaining a **Postgraduate Diploma** you will have:

A1. An appreciation of the fundamental principles of remote sensing and geographical information systems

A2. Acquired the ability to discuss selected aspects of the subject area that allows you to synthesise the current literature and engage in discussion with peers

A3. The ability to describe contemporary techniques used to analyse remotely sensed imagery and other geospatial data sets

A4. The capacity to identify and evaluate a range of geospatial data sources and data types

A5. The ability to demonstrate the application of the analysis methods available GIS and remote sensing software

A6. Developed transferable skills that enhance employability

A7. The capability to synthesise and critique scientific literature

Teaching and Learning Methods

To assist the development of your knowledge and understanding of remote sensing and geographical information systems, a wide range of teaching methods are employed. These include lectures, seminars, workshops, practical classes and independent research. You will be encouraged from an early stage to supplement and consolidate your understanding and knowledge by independent reading and you will be provided with learning support material and informal assistance to guide your private study. Throughout each semester feedback will be provided on assignments with the aim of enabling you to improve your skills and ability in future assessed work.

Assessment Methods

Assessment of your knowledge and understanding will be undertaken throughout the programme using a combination of formative assessment (designed to provide you with constructive feedback to help develop your knowledge and understanding) and summative assessment (designed to measure your achievements). Formative assessment will take place in part through informal assessment of work, for example staff members might provide informal feedback on a group project or presentation. Summative assessment will contribute to your marks and will usually involve a combination of coursework elements (which will include assignments, essays, project reports, literature reviews, the dissertation, etc.). Assessment of your knowledge and understanding will be undertaken primarily via these summative assessment methods, but you will also receive feedback on all formally assessed work so as to assist you in developing improved skills and ability in future assessed work.

Assessment Learning Objectives

Semester 1

Essay assignments (A1,A3, A7);
Technical Report Assignments (A1-5, A7);

Computer Programming Assignments (A3, A5-7);
Oral Presentation Assessments (A6-7).

Semester 2
Essay assignments (A1-3, A7);
Literature Review Assignments (A2-4, A7)
Technical Report Assignments (A1-5, A7);
Computer Programming Assignments (A3, A5-7);
Oral Presentation Assessment (A3-4, A6-7).
Dissertation Research Project (A1-9)

Subject Specific Intellectual and Research Skills

On successful completion of this programme you will be able to:

B1.   Critically analyse the literature relating to remote sensing and geographical information systems
B2.   Extract and synthesise information from a range of different sources
B3.   Use appropriate principles, theories and methods to design and undertake primary research within the subject area
B4.   Analyse and critically evaluate primary and secondary geospatial data
B5.   Solve geospatial problems
B6.   Convey scientific information in an appropriate academic style

Teaching and Learning Methods

The subject specific skills are, as is appropriate, embedded in the curriculum and are developed with many of the teaching methods discussed in section 10.1. Independent reading is, however, an important means of skills development.

Transferable and Generic Skills

On successful completion of this programme you will be able to:

C1.   Pursue knowledge in an in-depth and ordered way
C2.   Evaluate and solve problems
C3.   Process information using a variety of methods and synthesise literature
C4.   Manipulate and analyse data using numerical methods
C5.   Effectively use oral and written communication to convey scientific information
C6.   Safely and effectively plan and execute a project
C7.   Manage and prioritise workloads
C8.   Work effectively in a team and as an individual

Teaching and Learning Methods

The generic skills are, as is appropriate, embedded in the curriculum and are developed with many of the teaching methods discussed above. Independent reading is, however, an important means of skills development and communication skills are, in part, developed through written project work and tutorials.

Assessment Methods

Assessment of generic skills will be mainly formative and will be provided through assessment of, for example, group project work, presentations, coursework, etc.

Subject Specific Practical Skills

On successful completion of this programme you will be competent in :

D1.   Digital image processing
D2.   Spatial data analysis
D3.   Collecting and analysing spectral information

Teaching and Learning Methods

The generic skills are, as is appropriate, embedded in the curriculum and are developed with many of the teaching methods discussed above.

Assessment Methods

Assessment of generic skills will be mainly formative and will be provided through assessment of, for example, coursework and feedback during computer practical sessions, etc.

Programme Structure

The programme structure table is below:
Information about pre and co-requisites is included in individual module profiles.

Part I
Typical Programme content

The programme is studied full-time. Full-time study includes a taught component carried out over two semesters followed by the completion of a major research project during the summer. To successfully complete the programme, you will need to attain 120 CATS points by completing the taught element of the programme and 60 CATS points through your research project.

Some modules may have prerequisites to be satisfied from the modules available or from first degree. Advice on module selection will be provided by the programme convenor and your tutor. The research project will be defined in agreement with your tutor and supervised by an appropriate member of staff from the team of contributors. The project may be undertaken outside the University at an external organisation if appropriate. Such projects will be supervised by the staff from the School but you will also be given an industrial mentor.

Programme details

The structure of the programme and the modules currently offered are set out below. Of the modules shown against each year of your programme, some are compulsory (i.e. enrolment is automatic) and others are optional. A core module is a module which must be taken and passed by gaining a mark of 50% or more. A compulsory module is a module which must be taken by all students on the programme but which may be passed by compensation by gaining a mark greater than 35%. Against each year, you are directed to which modules are core and compulsory and which are optional. The optional modules, which may be passed by gaining a marker greater than 35%, are listed within an indicative list. There will always be choice but the options might vary between years. A list of optional modules will be available to you via the Student Record Self-Service system once you enrol at the University.

The programme is normally studied over twelve months full-time. The taught component of the programme consists of 30 study weeks divided into two semesters during which time students study eight modules (60 ECTS/120 CATS). Students who successful complete the taught component undertake a three-month period of supervised research for a Master's dissertation at a value of

30 ECTS/60 CATS.

Part I Compulsory

Code	Module Title	ECTS	Type
GEOG6087	Practical Skills in Remote Sensing 2019-20	7.5	Compulsory

Part I Core

Code	Module Title	ECTS	Type
GEOG6061	Core Skills in GIS 2019-20	7.5	Core
GEOG6111	Academic and Technical Skills Development 2019-20	7.5	Core
GEOG6112	Research Skills and Project Work 2019-20	7.5	Core

Part I Optional

Code	Module Title	ECTS	Type
GEOG6095	GIS for Environmental Management 2019-20	7.5	Optional
GEOG6109	Programming for GIS and Spatial Analyses 2019-20	7.5	Optional
GEOG6088	Programming Skills in Remote Sensing 2019-20	7.5	Optional
GEOG6027	Remote Sensing for Earth Observation 2019-20	7.5	Optional
GEOG6057	Topographic Data Analysis Techniques and Applications 2019-20	7.5	Optional
GEOG6096	GIS for Healthcare Management 2019-20	7.5	Optional

Part II

Part II Core

Code	Module Title	ECTS	Type
GEOG6036	Research Project 2020-21	30	Core

Progression Requirements
The programme will follow the University's regulations for ***Progression, Determination and Classification of Results: Standalone Masters Programmes*** as set out in the General Academic Regulations in the University Calendar: http://www.calendar.soton.ac.uk/sectionIV/sectIV-index.html

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:
- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- high speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations.
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- standard ICT tools such as Email, secure filestore and calendars.
- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling. Support includes daily Drop In at Highfield campus at 13.00 – 15.00 (Monday, Wednesday and Friday out of term-time) or via on-line chat on weekdays from 14.00 – 16.00. Arrangements can also be made for meetings via Skype.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia).
- the Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards
- Career and Employability services, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls and in the local community, (18.00-08.00)
- A Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides
- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as Nightline.

Associated with your programme you will be able to access:

- Module co-ordinators support. Module co-ordinators will be available at designated times during the week to discuss issues related to the particular modules you are studying at the time. This will be in addition to class contact time.
- Module handbooks/outlines. These will be available at the start of each module (often in online format). The Handbook includes the aims and learning outcomes of the module, the methods of assessment, relevant background material to the module and a session-by-session breakdown of the module together with appropriate reading lists.
- Within the Faculty, administrative support is provided by your Student Office which deals with student records and related issues and with queries related to your specific degree programme.
- Pastoral support through the Schools Senior Tutor above any academic support that may be required, which is available through the module co-ordinators and programme leader, as noted above.

Methods for evaluating the quality of teaching and learning

You will have the opportunity to have your say on the quality of the programme in the following ways:
- Completing student surveys for each module of the programme
- Acting as a student representative on various committees, e.g. Staff-Student Liaison Committees, Faculty

Education Committee OR providing comments to your student representative to feedback on your behalf.

• Serving as a student representative on Faculty Scrutiny Groups for programme validation

• Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Scrutiny Group

Further details on the University's quality assurance processes are given in the *Quality Handbook.*

Career Opportunities

Potential employment could be within the Earth Observation or geographical information systems/science (GIS) communities, consultancy companies, private and public sectors.

External Examiner(s) for the programme

Name: Dr Richard Armitage - University of Salford

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff: Student Liaison Committee in the first instance, and Student representatives on Staff: Student Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process.

External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their Personal Academic Tutor in the first instance.

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook.

Appendix 1:

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme also have to pay for:

Additional Costs

Type	Details
Clothing	You will need to wear suitable clothing when attending fieldcourses, e.g. waterproofs, walking boots. You can purchase these from any source.
Textbooks	Where a module specifies core texts these should generally be available on the reserve list in the library. However due to demand, students may prefer to buy their own copies. These can be purchased from any source. Some modules suggest reading texts as optional background reading. The library may hold copies of such texts, or alternatively you may wish to purchase your own copies. Although not essential reading, you may benefit from the additional reading materials for the module.
Approved Calculators	Candidates may use calculators in the examination room only as specified by the University and as permitted by the rubric of individual examination papers. The University approved model is Casio FX-570 and Casio FX-85GT Plus. This may be purchased from any source and no longer needs to carry the University logo.
Fieldwork: logistical costs	Any costs associated with conducting fieldwork as part of the dissertation research must be covered by the student e.g. Accommodation, Insurance, Travel costs, Immunisation/vaccination costs
Printing and Photocopying Costs	In the majority of cases, coursework such as essays; projects; dissertations is likely to be submitted on line. However, there are some items where it is not possible to submit on line and students will be asked to provide a printed copy. A list of the University printing costs can be found here: [http://www.southampton.ac.uk/isolutions/students/printing-for-students.page

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in the University Calendar available at www.calendar.soton.ac.uk.