

School of Geography & Geosciences

Environmental Geography (EG) modules

EG3020 Global Climate Change				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	1
Planned timetable:	9.00 am - 10.00 am Wed and Thu, 2.00 pm - 5.00 pm Tue			
Climate change is one of the most challenging environmental problems currently facing society. Recent global warming likely lies outside the range of natural variability when compared to the last 1000 or even 2000 years. This module addresses how this consensus view has been derived and considers the scientific evidence and arguments that underpin our current understanding of climate change. The module examines both strengths and limitations of long-term proxy climate records, historical datasets based upon direct observation, models of the climate system, and areas of greatest uncertainty within current knowledge. The impacts and policy responses to climate change are also introduced.				
Programme module type:	Compulsory for MGeol Earth Sciences and BSc Environmental Earth Sciences. Optional for Geography or Sustainable Development			
Pre-requisite(s):	Normally ES2002 or ES2003 or (GG2011 and GG2012)			
Anti-requisite(s):	GG3265, GG3268			
Learning and teaching methods and delivery:	Weekly contact: 2 x 1-hour lectures and 1 x 2-hour practical.			
	Scheduled learning: 44 hours		Guided independent study: 106 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework = 50%			
Module Co-ordinator:	Dr R Wilson			
Lecturer(s)/Tutor(s):	Dr R Wilson, Dr T Hill, Dr T Raub			

EG3021 Contemporary Environmental Problems: Applications and Solutions				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	1
Planned timetable:	11.00 am - 1.00 pm Wed			
Environmental problems abound on local, regional, and global scales. The ability of current and future generations to understand, predict, and ameliorate these problems requires a solid understanding of links between their causes, processes, and environmental symptoms under various forcing conditions. This course considers several case studies of important terrestrial, marine, and atmospheric environmental problems, allowing students to evaluate the scientific evidence and challenging them to understand the physical, biological, and chemical processes that underpin their expression. The assessment will mimic the types of analysis/report used in industrial settings to describe, report and advise regarding environmental problems.				
Programme module type:	Compulsory for MGeol Earth Sciences and BSc Environmental Earth Sciences. Optional for Geography or Sustainable Development			
Pre-requisite(s):	Normally ES2002 or ES2003 or (GG2011 and GG2012)			
Learning and teaching methods and delivery:	Weekly contact: 2-hour lectures (x 11 weeks), 3 x 3-hour practical sessions and 6 tutorials over the semester.			
	Scheduled learning: 37 hours		Guided independent study: 154 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework = 50%			
Module Co-ordinator:	Dr M Singer			
Lecturer(s)/Tutor(s):	Dr M Singer, Dr H Burdett, Dr T Hill			

Geography & Geosciences - Honours Level 2014/15 - August 2014

EG3031 Special Topic for Physical Geography				
SCOTCAT Credits:	5	SCQF Level 9	Semester:	1
Availability restrictions:	Available only to Geography students			
Planned timetable:	To be arranged.			
This module provides support and guidance for geography students taking one of the Earth & Environmental Science modules offered as part of the Geography degree (normally ES3020-ES3030). In addition Geography MA and BSc students taking 15-credit modules from the Science Faculty may find themselves 5 credits short and this module provides the necessary credit top-up.				
Programme module type:	Optional for Geography or Sustainable Development students also taking one of EG3020 - EG3030			
Pre-requisite(s):	GG2011 and GG2012	Co-requisite(s):	One from EG3020 - EG3030	
Learning and teaching methods and delivery:	Weekly contact: Occasional tutorials.			
	Scheduled learning: 8 hours		Guided independent study: 42 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr T Hill			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

EG3032 Special Environmental Topic for Physical Geography				
SCOTCAT Credits:	5	SCQF Level 9	Semester:	1
Availability restrictions:	Only available to students on a Geography or Sustainable Development Honours programme			
Planned timetable:	To be arranged.			
This module provides support and guidance for geography students taking one of the Earth & Environmental Science modules offered as part of the Geography degree (normally EG3020-EG3030). In addition Geography MA and BSc students taking 15-credit modules from the Science Faculty may find themselves 5 credits short and this module provides the necessary credit top-up. The present module is designed to pair with environmental science-based modules such as EG3021 Contemporary Environmental Problems: Applications and Solutions.				
Programme module type:	Optional for Geography or Sustainable Development students also taking one of EG3020 - EG3030			
Co-requisite(s):	Normally one from EG3020 - EG3030- currently EG3021			
Learning and teaching methods and delivery:	Weekly contact: 2-hours of tutorials (x 4 weeks)			
	Scheduled learning: 8 hours		Guided independent study: 42 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr M Singer			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

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EG4020 Geochronology			
SCOTCAT Credits:	15	SCQF Level 10	Semester: 1
Planned timetable:	11.00 am - 1.00 pm Mon, 2.00 pm - 5.00 pm Mon		
<p>Determining the chronological age of events is one of the most fundamental questions in Earth and Environmental Sciences. However this simple question presents extraordinary challenges and interpreting age data is complex. Different methods are used for historical, Quaternary and geological timescales, each of which has its own strengths and drawbacks. Dating is achieved using methods that vary from measuring lichens with a ruler to detecting attogram levels of isotopes using some of the most precise instrumentation in physical science. We will explore a variety of simple and complex tools to understand the time frames of Earth processes such as erosion rates, sequences of moraine deposition, and successions of volcanic eruptions. Understanding how processes are dated in many cases requires the analyst to understand more fully the process itself. This module will be of interest to anyone involved in understanding processes across historical and Quaternary timeframes to those in Deep Time.</p>			
Programme module type:	Optional for all Earth & Environmental Science BSc and M.Geol .degrees and Geography or Sustainable Development M.A. and BSc		
Pre-requisite(s):	Normally ES2002 or ES2003 or (GG2011 and GG2012)		
Anti-requisite(s):	GG3269		
Learning and teaching methods and delivery:	Weekly contact: 2-hour lectures (x 11 weeks), 3 x 2-hour practical sessions, 2 x 1-hour mentoring for orals over the semestester.		
	Scheduled learning: 30 hours	Guided independent study: 120 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%		
	As used by St Andrews: 2-hour Written Examination = 50%, Practical Report = 30%, Oral Presentation = 20%		
Module Co-ordinator:	Dr V Rinterknecht		
Lecturer(s)/Tutor(s):	Dr V Rinterknecht, Dr R Wilson, Dr T Raub, Dr A Burke, Dr R Robinson		

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EG4031 Analytical Sciences for Physical Geography				
SCOTCAT Credits:	5	SCQF Level 10	Semester:	1
Availability restrictions:	Available only to students on a Geography Honours programme.			
Planned timetable:	To be arranged.			
<p>The module comprises a series of seven lectures about analytical science. The lectures explain the basic principles of accuracy and precision and these are illustrated in the context of four of the most common analytical methods used in physical geoscience. This module provides analytical science skills training to support students taking one of the Year 4 Earth & Environmental Science modules offered as part of the Geography degree (EG4020-EG4030). Students are asked to research an analytical method that complements teaching in the associated EG402X module. This is then presented in a poster format imitating the poster sessions at major conferences. Posters are marked by both students (peer assessment) and staff, and any discrepancies between those marks are discussed. The module will give BSc Geography students the necessary training in analytical science to allow them to excel in the accompanying EG402X module.</p>				
Programme module type:	Optional for Geography or Sustainable Development students also taking one of EG4020 - EG4030.			
Pre-requisite(s):	Passes at Grade 11 or better in GG2011 and GG2012			
Co-requisite(s):	One of EG4020 - EG4030			
Learning and teaching methods and delivery:	Weekly contact: 7 x 1-hour lectures and 1 x 8-hour poster presentation day over the semester.			
	Scheduled learning: 15 hours		Guided independent study: 35 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework (Poster session) = 100%			
Module Co-ordinator:	Dr A Finch			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

Earth Sciences (ES) modules

ES3001 Geological Mapping				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	1
Planned timetable:	To be arranged.			
<p>This module provides training in independently constructing and interpreting geological maps and cross sections. It develops the student's abilities to recognise structures in both two and three dimensions and, by inferring how these structures have changed with time, to develop four-dimensional intellectual skills. The module provides training in defining geological sampling strategies and field report writing.</p>				
Programme module type:	Compulsory for BSc Geology, joint degrees with Biology and Chemistry, and MGeol Earth Sciences			
Pre-requisite(s):	Normally ES2001 and ES2002	Required for:	ES3006, ES3010	
Learning and teaching methods and delivery:	Weekly contact: 4 map and cross-section practicals (3 hours each) and lectures over 11 weeks and occasional 2-hour fieldwork tutorials.			
	Scheduled learning: 19 hours		Guided independent study: 131 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr T Prave			
Lecturer(s)/Tutor(s):	Dr T Prave			

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ES3002 Analytical and Statistical Methods in Earth Sciences				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	1
Planned timetable:	11.00 am - 1.00 pm Mon (analytical methods), 2.00 pm - 4.00 pm Thu (stats)			
<p>This module covers the principles behind, and practical application of, analytical science and data handling in Earth Sciences. Four key analytical methods are presented and students operate instruments under technical supervision. Statistical training includes (i) understanding data types, (ii) data presentation and basic descriptive statistics, (iii) probability, (iv) hypothesis testing using parametric statistics, (v) correlation and regression, (vi) introduction to numerical methods. Each student will have an opportunity to research an unusual analytical method, relevant to their own interests. Skills taught here reinforce Earth Sciences honours teaching, particularly the independent research project module.</p>				
Programme module type:	Compulsory for BSc Geology, Environmental Earth Science, joint degrees with Biology and Chemistry, and MGeol Earth Sciences			
Pre-requisite(s):	Normally ES2001 and (ES2002 or ES2003)	Required for:	ES3003, ES3008	
Learning and teaching methods and delivery:	Weekly contact: Lectures, practicals, tutorials and lab time averaging 5 hours per week.			
	Scheduled learning: 55 hours		Guided independent study: 95 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr A Finch			
Lecturer(s)/Tutor(s):	Dr A Finch, Dr R Wilson			

ES3003 GIS and Spatial Analysis for Earth Scientists				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	2
Planned timetable:	10.00 am - 1.00 pm Mon, Wed (lecture plus lab session) (Weeks 1 - 6)			
<p>This module covers the principles behind, and practical application of, spatial analysis in Earth Sciences. This includes the analysis of primary and secondary datasets, how to access and import a variety of data types, and the fundamentals of various spatial analytical methods including spatial statistics and modeling within a GIS environment. The module also prepares students for the correct presentation of maps and datasets in the dissertation proposal and thesis.</p>				
Programme module type:	Compulsory for BSc Geology and Environmental Earth Science, and MGeol Earth Sciences			
Pre-requisite(s):	Normally ES3002			
Learning and teaching methods and delivery:	Weekly contact: 5 lectures and 12 practicals and support sessions (Weeks 1-6).			
	Scheduled learning: 48 hours		Guided independent study: 102 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr R Robinson			
Lecturer(s)/Tutor(s):	Dr R Robinson			

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ES3004 Processes and Products in Sedimentary Systems				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	2
Planned timetable:	10.00 am - 1.00 pm Mon and Wed (lectures), 2.00 - 5.00 pm Fri (practicals). 3 field days (9.00 am - 5.00 pm)			
This core module provides fundamental knowledge and training in describing, studying and interpreting sediments, sedimentary rocks and stratigraphic frameworks. The concepts and methodologies of process sedimentology, stratigraphy and sedimentary petrography will be taught, and training undertaken using fieldwork and practicals. The module serves as preparation for subsequent modules on related topics and for field-based modules, including Advanced Geological Mapping, the Research dissertation, and the fourth-year field course.				
Programme module type:	Compulsory for BSc Geology, Environmental Earth Science, joint degrees with Biology and Chemistry, and MGeol Earth Sciences			
Pre-requisite(s):	Normally ES2001 and (ES2002 or ES2003)			
Learning and teaching methods and delivery:	Weekly contact: Weekly lectures and practicals averaging 3 hours per week plus field training			
	Scheduled learning: 54 hours		Guided independent study: 96 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework = 50%			
Module Co-ordinator:	Dr T Prave			
Lecturer(s)/Tutor(s):	Dr T Prave, Dr M Singer, Dr R Robinson, Mr S Allison			

ES3006 Advanced Geological Mapping				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	2
Availability restrictions:	Not available to General Degree students.			
Planned timetable:	9.00 am - 5.00 pm Fri (map practicals)			
Geological maps are not just summaries of rocks - they are ways of conveying three-dimensional structure and geological history. This module starts with lab-based analysis of classic geology maps and field-based skills training sessions, followed by two one-week field courses. Field assessment comprises field notes and geological maps within holistic, problem-based exercises, determining the geology of these areas from first principles. At the end of the module, students will not only have learned how to record, interpret and present field data, but also to visualise geology in four dimensions. This module is one of the most important for developing confidence in field techniques prior to independent research projects.				
Programme module type:	Compulsory for BSc Geology, joint degrees with Biology and Chemistry, and MGeol Earth Sciences			
Pre-requisite(s):	ES3001	Required for:	ES4001	
Learning and teaching methods and delivery:	Weekly contact: 8 practical sessions through semester plus residential field class.			
	Scheduled learning: 88 hours		Guided independent study: 62 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr A Finch			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

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ES3007 Structural Geology and Tectonics				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	2
Planned timetable:	11.00 am Tue and Thu (lectures), 2.00 - 5.00 pm (practicals)			
This module covers the principles of rock deformation and associated metamorphism, and the tectonic processes that drive this deformation. The goals of this course are: a) the development of skills in the structural analysis of rock bodies to gain an understanding of the geometries, sequencing, and kinematics of deformational features; b) understanding of tectonic principles and controls on rock deformation and mountain building.				
Programme module type:	Compulsory for BSc Geology and MGeol Earth Sciences			
Pre-requisite(s):	Normally ES2001 and ES2002			
Learning and teaching methods and delivery:	Weekly contact: 1 x 2-hour lecture (x 11 weeks), 7 x 3-hour practicals during the semester and fieldwork			
	Scheduled learning: 55 hours		Guided independent study: 95 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework = 50%			
Module Co-ordinator:	Prof P Cawood			
Lecturer(s)/Tutor(s):	Prof P Cawood			

ES3008 Geochemistry				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	1
Planned timetable:	10.00 am Tue and Thu (lectures), 2.00 - 5.00 Thu (practicals)			
This module focuses on the application of chemical principles to the Earth sciences, and the development of these principles as valuable tools available to the modern Earth scientist. The course aims to develop a comprehensive understanding of: (1) the origin and distribution of chemical elements in the Earth and solar system, (2) the major chemical reactions that take place on the surface of the Earth and its interior, and (3) how matter is cycled between the Earth's major chemical reservoirs. These concepts are developed through the application of thermodynamics to natural systems and the use of radiogenic and stable isotopes, based on theoretical and practical discussions. These tools are used in the module to allow quantitative predictions regarding the outcome of chemical reactions associated with geological processes.				
Programme module type:	Compulsory for BSc Environmental Earth Science, MGeol Earth Sciences, BSc Geology and joint degrees with Biology and Chemistry			
Pre-requisite(s):	Normally ES3002, ES3005			
Learning and teaching methods and delivery:	Weekly contact: 17 lectures, 15 hours of laboratory classes, 2 or more field classes over the semester.			
	Scheduled learning: 54 hours		Guided independent study: 96 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework = 50%			
Module Co-ordinator:	Dr N Allison			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

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ES3009 Igneous and Metamorphic Petrology				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	1
Planned timetable:	2.00 pm - 5.00 pm Mon (practicals), 9.00 am Tue and Thu (lectures)			
This is a core module in Geology delivered early in the honours programme providing a framework for interpreting major petrological processes acting within the Earth's crust and mantle. The module serves as preparation for subsequent modules on related topics and for field-based modules, including Advanced Geological Mapping, the Research dissertation, and the Alps field course.				
Programme module type:	Compulsory for BSc Geology, joint degrees with Biology and Chemistry, and MGeol Earth Sciences; optional for BSc Environmental Earth Science			
Pre-requisite(s):	Normally ES2001 and (ES2002 or ES2003)	Required for:	ES4006	
Learning and teaching methods and delivery:	Weekly contact: 2 x 1-hour lectures (x 11 weeks), 3-hour practicals most weeks.			
	Scheduled learning: 50 hours		Guided independent study: 100 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 50%, Coursework = 0%			
	As used by St Andrews: 2-hour Written Examination = 50%, 2 x 2-hour Practical Examination = 50%			
Module Co-ordinator:	Dr C Donaldson			
Lecturer(s)/Tutor(s):	Dr C Donaldson, Dr A Finch			

ES3010 Advanced Environmental Field Methods				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	2
Planned timetable:	9.00 am - 5.00 pm Fri (Weeks 1 - 4)			
This forms the introduction to methodologies and training in applied environmental problems. This module starts with field-based skills training sessions. Specific environmental problems will be identified, and researched in detail before a one-week field excursion where an environmental impact problem will be addressed in the field using geological and geophysical mapping, and analysis of surface and sub-surface hydrology.				
Programme module type:	Compulsory for BSc Environmental Earth Science			
Pre-requisite(s):	ES3001	Required for:	ES4008	
Learning and teaching methods and delivery:	Weekly contact: 8 field-based skills training sessions, fortnightly seminar, one 1-week field excursion, and 1-week of lab-based data analysis .			
	Scheduled learning: 53 hours		Guided independent study: 97 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr R Wilson			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

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ES3011 Global Biogeochemical Cycles				
SCOTCAT Credits:	15	SCQF Level 9	Semester:	2
Planned timetable:	To be arranged.			
<p>Environmental Earth Science is inherently multi-disciplinary, but many environmental science courses focus on specific reservoirs of the Earth system (e.g., the atmosphere, oceans, or continental crust), rather than examining the system as a whole. The study of global biogeochemical cycling crosses these disciplinary boundaries, following specific elements as they are cycled through the Earth surface by physical, chemical, and biological transformations. This module will focus on the cycling of five elements critical to life on Earth - Carbon, Oxygen, Sulfur, Phosphorus, and Nitrogen – using examples from both modern and ancient environments, and their response to human influence. An emphasis will be placed on understanding proxies utilized for unravelling these processes in the environment and in the rock record, along with modern quantitative methods used to constrain these cycles.</p>				
Programme module type:	Compulsory for Environmental Earth Sciences and MGeol Earth Sciences Optional for Geology, Biology and Geology, Chemistry and Geology			
Pre-requisite(s):	Normally ES2002 or ES2003, and ES3008			
Learning and teaching methods and delivery:	Weekly contact: 2-hour lectures and 2-hour practical sessions (x 8 weeks).			
	Scheduled learning: 32 hours		Guided independent study: 118 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework = 50%			
Module Co-ordinator:	Dr A Zerkle			
Lecturer(s)/Tutor(s):	Dr A Zerkle, Dr M Claire			

ES3099 Field Methods in Geosciences				
SCOTCAT Credits:	30	SCQF Level 9	Semester:	2
Availability restrictions:	Available only to visiting students.			
Planned timetable:	none - field-based module.			
<p>This module is designed exclusively for non-graduating overseas undergraduate students seeking advanced training in geological field methods. It consists of hands-on experience honing observational and mapping skills by participating in highly focused residential and one-day excursions and associated laboratory classes. The module takes full advantage of the University's location close to some classic geological locations, normally including the central Spain Sierra Norte region, the Moine thrust system, the Buchan and Barrovian metamorphic zones, the Girvan-Ballantrae ophiolite and the Hebridean plutonic and volcanic centres.</p>				
Programme module type:	Available to visiting students only.			
Pre-requisite(s):	Must be studying Earth Science at an overseas university			
Learning and teaching methods and delivery:	Weekly contact: Occasional lectures, tutorials and practicals in addition to fieldwork - this is predominantly a residential field-based module.			
	Scheduled learning: 268 hours		Guided independent study: 32 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
odule Co-ordinator:	Dr R Robinson			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

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ES4001 Field Excursion and Map Interpretation				
SCOTCAT Credits:	15	SCQF Level 10	Semester:	1
Planned timetable:	12 days fieldwork in August - September. 9.00 am - 5.00 pm Fri (practicals)			
Building on the field training of JH, this module develops the field observation and interpretation skills of collecting, recording, interpreting and synthesising data in the field and from geological maps and cross-sections. The field course will be thematic and examine all aspects of a region using an integrated approach. Theme and location may vary but the excursion will generally be based within a well-exposed orogenic belt with the aim of traversing from the foreland to the interior. Fieldwork will be combined with the interpretation of a region as represented on a geological map. Students will also be trained in the advanced techniques of interpreting remotely sensed images of the Earth's surface and geological maps, and in the construction of cross-sections.				
Programme module type:	Compulsory for BSc Geology and MGeol Earth Sciences			
Pre-requisite(s):	normally ES3006			
Learning and teaching methods and delivery:	Weekly contact: 2-week field course and 4 lab sessions.			
	Scheduled learning: 84 hours		Guided independent study: 66 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr T Prave			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

ES4002 Research Review, Essay and Seminar				
SCOTCAT Credits:	15	SCQF Level 10	Semester:	1 & 2 (taught twice)
Availability restrictions:	BSc students may only take this module in semester 1, MGeol students can take this module in either semester.			
Planned timetable:	Not applicable.			
The student proposes an Earth Science topic, one that has not been directly covered in a module. They discuss the suitability of the topic with a lecturer who agrees to become adviser to the student. Student and adviser are required to meet 2 further times during the module. Literature and web-based research is conducted and the student writes a critical review of ca. 3,500 words. The same material is also presented in a 15 minute seminar to staff and classmates. Advice on critical writing and presenting talks is given a year before the start of the module, on entry to Junior Honours, for use throughout the Honours programme. The seminar is assessed by both lecturers and peers. The module is normally carried out in Semester 1 but a Semester 2 Research Review may be considered for MGeol students on a case by case basis.				
Programme module type:	Compulsory for BSc Geology and Environmental Earth Science, and MGeol Earth Sciences			
Pre-requisite(s):	Admission to an Honours Earth Sciences programme or Environmental Earth Science			
Learning and teaching methods and delivery:	Weekly contact: Occasional lecture and 3 meetings with adviser spread across the semester.			
	Scheduled learning: 10 hours		Guided independent study: 140 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 15%, Coursework = 85%			
	As used by St Andrews: Practical Examination = 15%, Coursework = 85%			
Module Co-ordinator:	Dr C Donaldson			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

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ES4003 Research Dissertation				
SCOTCAT Credits:	45	SCQF Level 10	Semester:	Whole Year
Availability restrictions:	Available only to Single Honours Earth Science students			
Planned timetable:	Not applicable.			
<p>An individual research project which allows the student to pursue in depth a topic of personal interest. The student works largely independently of supervision and has the opportunity to demonstrate individuality, initiative and enterprise. Skills of planning and executing research are learnt, as well as the ability to work independently, and present the results orally and in dissertation form (up to 10,000 words). (Guidelines for printing and binding dissertations can be found at: http://www.st-andrews.ac.uk/printanddesign/dissertation/)</p>				
Programme module type:	Compulsory for BSc Geology and Environmental Earth Science			
Pre-requisite(s):	Admission to an Honours Earth Sciences programme or Environmental Earth Science			
Learning and teaching methods and delivery:	Weekly contact: Regular meetings with supervisor arranged as required.			
	Scheduled learning: 20 hours		Guided independent study: 430 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 10%, Coursework = 90%			
	As used by St Andrews: Proposal = 5%, Oral presentation = 10%, Dissertation = 85%			
Module Co-ordinator:	Dr T D Raub and Dr T Hill			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

ES4006 Advanced Igneous Petrogenesis				
SCOTCAT Credits:	15	SCQF Level 10	Semester:	1
Planned timetable:	10.00 am Mon and Wed (lectures). 10.00 - 1.00 pm Tue (practicals)			
<p>The Earth's crust is largely created by acid and basic magmatism and many of the planet's critical resources are formed from igneous processes. The module explores the nature of that magmatism, the petrography and geochemistry of the minerals and rocks created, and the petrogenesis and evolution of the magma. The petrological characteristics of the continental crust and of the upper mantle, the principal sources of acid and basic magmas, are examined in detail for the influence which these have on the magmas created by partial melting. The economic significance of alkaline rocks as the hosts for many of the world's critical metals is considered.</p>				
Programme module type:	Optional for BSc Geology, Environmental Earth Science, joint degrees with Biology and Chemistry, and MGeol Earth Sciences			
Pre-requisite(s):	Normally ES3009			
Learning and teaching methods and delivery:	Weekly contact: 18 lectures, 15 hours of laboratory work, 18 hours of field-related study over the semester.			
	Scheduled learning: 50 hours		Guided independent study: 100 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 50%, Coursework = 0%			
	As used by St Andrews: 2-hour Written Examination = 50%, 3-hour Practical Examination = 50%			
Module Co-ordinator:	Dr C Donaldson			
Lecturer(s)/Tutor(s):	Dr C Donaldson, Dr A Finch			

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ES4007 Petroleum Exploration and Geophysics				
SCOTCAT Credits:	15	SCQF Level 10	Semester:	1
Planned timetable:	11.00 am - 1.00 pm Thu (lectures), 2.00 - 5.00 pm Thu (practicals)			
The fundamental concepts, techniques and practices of the hydrocarbon exploration industry are presented. Students will gain a thorough understanding of the geoscience of petroleum exploration, particularly using geophysical methods, and a working knowledge of modern concepts in oil and gas geology.				
Programme module type:	Optional for BSc Geology, Environmental Earth Science, joint degrees with Biology and Chemistry, and MGeol Earth Sciences			
Pre-requisite(s):	Normally ES2001 and (ES2002 or ES2003)			
Learning and teaching methods and delivery:	Weekly contact: 17 lectures, 15 hours laboratory classes, field classes over the semester.			
	Scheduled learning: 38 hours		Guided independent study: 112 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework = 50%			
Module Co-ordinator:	Dr R Bates			
Lecturer(s)/Tutor(s):	Dr R Bates			

ES4008 Environmental Excursion and Maps				
SCOTCAT Credits:	15	SCQF Level 10	Semester:	1
Planned timetable:	12 days fieldwork in August - September. 9.00 am - 5.00 pm Fri (practicals)			
Building on the training elements of JH, this module is designed to further develop the mapping and geochemical analytical skills used to solve geo-environmental problems. The field course will be thematic and examine environmental and geological aspects of a region using an integrated approach. Theme and location may vary. Additional mapping exercises will include use of aerial photographs, thematic mapping and GIS, and application of applied geophysical surveying and key analytical techniques.				
Programme module type:	Compulsory for BSc Environmental Earth Science			
Pre-requisite(s):	ES3010			
Learning and teaching methods and delivery:	Weekly contact: 2-week field course and 4 lab sessions.			
	Scheduled learning: 84 hours		Guided independent study: 66 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr R Robinson			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

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ES4010 Joint Honours Research Project				
SCOTCAT Credits:	30	SCQF Level 10	Semester:	Whole Year
Planned timetable:	Not applicable.			
An individual research project allows the student to pursue in depth a topic of personal interest. The student works largely independently and has the opportunity to demonstrate individuality, initiative and enterprise. Projects will normally include an aspect of field and analytical science. Skills of planning and executing research are learned, as well as the ability to work independently, and present the results orally and in dissertation form (up to 7,000 words). (Guidelines for printing and binding dissertations can be found at: http://www.st-andrews.ac.uk/printanddesign/dissertation/)				
Programme module type:	EITHER (ES4010 and CH4448) OR ID4441 are compulsory for joint degrees with Chemistry			
Pre-requisite(s):	Admission to Joint Honours Geology and Chemistry			
Learning and teaching methods and delivery:	Weekly contact: Regular meetings with supervisor arranged as required.			
	Scheduled learning: 20 hours		Guided independent study: 280 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 10%, Coursework = 90%			
	As used by St Andrews: Proposal = 5%, Oral Presentation = 10%, Dissertation = 85%			
Module Co-ordinator:	Dr T Raub			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

ES4011 Work Placement in Earth Sciences				
SCOTCAT Credits:	30	SCQF Level 10	Semester:	1 or 2
Planned timetable:	To be arranged.			
Practical experience of Earth Sciences is important to graduate job prospects and for students to understand the practical relevance of taught material course. This module is a platform for the students to obtain experience of the workplace through an 8-week industrial placement. The student finds their own work placement, some with the assistance of staff connections in industry and alumni. Work placements can be of a variety of forms, varying from office or lab-based work to engineering geology at sites in the UK to exploration geology across the world. The performance of the student in the workplace is assessed using similar criteria to those used when applying for Chartered (CGeol) status. The student reports on their activities during placement at the end of the placement period.				
Programme module type:	ES4011 or ES4012 is compulsory for MGeol Earth Sciences			
Pre-requisite(s):	Normally ES2001 and ES2002 and Entry to MGeol Earth Sciences.			
Learning and teaching methods and delivery:	This is a Study Abroad or Work Placement module.			
	Weekly contact: Meetings.			
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 30%, Coursework = 70%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr R Robinson			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

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ES4012 Research Placement in Earth Sciences				
SCOTCAT Credits:	30	SCQF Level 10	Semester:	1 or 2
Planned timetable:	To be arranged.			
<p>Practical experience of Earth Sciences is important to graduate job prospects and for students to understand the practical relevance of taught material in the course. The present module is a platform for the students to obtain experience of the working in an academic research team through a research placement. The student finds their own placement by negotiating with staff. The performance of the student in the workplace is assessed using similar criteria to those used when applying for Chartered (CGeol) status. The student reports on their activities during placement at the end of the placement period.</p>				
Programme module type:	ES4011 or ES4012 is compulsory for MGeol Earth Sciences			
Pre-requisite(s):	Normally ES2001 and ES2002 and Entry to MGeol Earth Sciences.			
Learning and teaching methods and delivery:	Weekly contact: Meetings.			
	Scheduled learning: 0 hours		Guided independent study: 0 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr R Bates			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

ES5001 Expedition Field Course				
SCOTCAT Credits:	15	SCQF Level 11	Semester:	Summer
Planned timetable:	To be arranged.			
<p>Fieldwork in Earth Sciences is key to graduate job prospects and is a platform for students to bring together the many aspects of Earth Sciences. The present module will involve the students not just in carrying out fieldwork, but also in the logistical and interpersonal sides of success fieldwork design. Students will identify a field area for study in consultation with a member of the teaching staff, which includes several aspects of Earth sciences, such as igneous, sedimentary, economic and environmental geology. The students will form a team and divide the responsibilities for fieldwork and logistics. The assessment will include a memoir that will summarise the geological history of the area, similar to that published by a Geological Survey or the exploration industry. Some student groups may choose to use this module to carry out ambitious fieldwork in a remote setting.</p>				
Programme module type:	Optional for MGeol in Earth Sciences			
Pre-requisite(s):	Entry to Year 5 of MGeol Earth Sciences			
Learning and teaching methods and delivery:	Weekly contact: 5 hours of orientation/tutorials over 2 weeks			
	Scheduled learning: 10 hours		Guided independent study: 140 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr A Finch			

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ES5003 Research Dissertation				
SCOTCAT Credits:	60	SCQF Level 11	Semester:	Whole Year
<p>An individual research project on a topic in geological sciences which allows the student to pursue in depth a topic of personal interest. The student works largely independently of supervision and has the opportunity to demonstrate individuality, initiative and enterprise. Skills of planning and executing research are learnt, as well as the ability to work independently, and present the results orally and in dissertation form (up to 7,000 words). The project report will be as a publication-ready article in the manner of the journal "Geology".</p>				
Programme module type:	Compulsory for MGeol Earth Sciences			
Pre-requisite(s):	Entry to Year 5 of MGeol Earth Sciences			
Learning and teaching methods and delivery:	Weekly contact: Regular meetings with supervisor arranged as required.			
	Scheduled learning: 30 hours		Guided independent study: 570 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100% (Project proposal = 5%, Oral Presentation = 10%, Dissertation = 85%)			
Module Co-ordinator:	Dr T Raub and Dr T Hill			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

ES5004 Integrated Earth Sciences				
SCOTCAT Credits:	30	SCQF Level 11	Semester:	Whole Year
Planned timetable:	To be arranged.			
<p>This module requires students to think of themselves as practitioners of a single integrated subject and thereby to bring together the various themes they have explored in the modules taken through their degree programme. It also promotes independent, critical thinking across the subject. It is assessed by reports on talks/key topics, attendance at a major international conference (EGU) and a single 4-hour exam, in which students are given many different forms of geological data (numerical, thin section, hand specimen, maps etc.) and asked to solve a complex geological problem. The module also acts as a platform through which we deliver employment skills and involves a mock job interview.</p>				
Programme module type:	Compulsory for MGeol Earth Sciences			
Pre-requisite(s):	Entry to Year 5 of MGeol Earth Sciences			
Anti-requisite(s):	ES4004			
Learning and teaching methods and delivery:	Weekly contact: Tutorials, mock job interview, assistance in preparation of EGU spread throughout the year.			
	Scheduled learning: 30 hours		Guided independent study: 270 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = %, Coursework = 50%			
	As used by St Andrews: 4-hour Written Examination = 50%, Coursework = 50%			
Module Co-ordinator:	Dr R Robinson			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

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ES5009 Geodynamics				
SCOTCAT Credits:	15	SCQF Level 11	Semester:	2
Planned timetable:	9.00 am - 10.00 am Tue and Wed; 9.00 am - 5.00 pm Fri (Weeks 2,5,9)			
A study of the geodynamic evolution of Earth's crust since the Archaean, the evolution of convergent and divergent margins, and the relationships between tectonics, erosion and climate. hydrosphere. The module contrasts geodynamic evolution in the Archaean, Proterozoic, Palaeozoic, Mesozoic and Cenozoic using a number of case studies, including examples visited in the field. The module develops skills of geodynamic interpretation, field observation, use of numerical models, report writing and oral presentation.				
Programme module type:	Optional for MGeol Earth Sciences, BSc Geology, Environmental Earth Science, and joint degrees in Biology and Chemistry			
Pre-requisite(s):	Normally ES2001 and (ES2002 or ES2003)	Anti-requisite(s):	ES4009	
Learning and teaching methods and delivery:	Weekly contact: 2 x 1-hour lectures (x 11 weeks) , plus 2 extended laboratory classes, and 2 days in the field during the semester.			
	Scheduled learning: 50 hours		Guided independent study: 100 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework = 50%			
Module Co-ordinator:	Prof P Cawood			
Lecturer(s)/Tutor(s):	Earth and Environmental Sciences staff			

ES5010 Environmental Geochemistry				
SCOTCAT Credits:	15	SCQF Level 11	Semester:	2
Planned timetable:	To be arranged.			
Many of the environmental challenges facing society revolve around the cycling of natural materials between fluid and solid phases. Some of the most fundamental aspects of Earth System development are investigated through geochemical methodologies that characterise and interrogate processes operating at the interface between the solid Earth and the fluid Earth. Further, the processes that concentrate many natural resources are a result of fluid-solid interactions that can be studied using organic and aqueous geochemistry. This module focuses on training in the state-of-the art techniques and methodologies that are tools that can be applied widely to address questions about environmental changes and chemistry in sediments and natural waters and, as well as utilisation and exploitation of hydrocarbon resources and Earth System evolution through time.				
Programme module type:	Optional for MGeol Earth Sciences, BSc Geology, Environmental Earth Science, and joint degrees in Biology and Chemistry			
Pre-requisite(s):	ES3008			
Learning and teaching methods and delivery:	Weekly contact: 1-hour lecture (x 10 weeks) 5 x 3-hour practical sessions, 1 x 8-hour session of project presentations over the semester.			
	Scheduled learning: 33 hours		Guided independent study: 117 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 30%, Coursework = 70%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr H Oduro			
Lecturer(s)/Tutor(s):	Dr H Oduro, Dr M Singer, Dr H Burdett			

Geography (GG) modules

GG3226 Population Studies: Europe before 1914				
SCOTCAT Credits:	20	SCQF Level 9	Semester:	1
Planned timetable:	To be arranged.			
The module introduces the inter-disciplinary field of population studies through the study of the demography of Western Europe between c.1680 and c.1914. It focuses on the major transformations in mortality and fertility that fundamentally changed the demographic dynamics of European populations. Basic demographic measures and relationships that underpin any study of population are first introduced before moving to a detailed examination of the complex set of relationships which underlay Europe's 'demographic transition'. Practical sessions provide hands-on experience of working with historical population sources. Particular attention is paid to geographies of population change in England and Scotland. The module provides a firm foundation from which to develop an understanding of contemporary population change.				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development			
Pre-requisite(s):	Passes at Grade 11 or better in GG2011 and GG2012, or in SD2001 and SD2002			
Learning and teaching methods and delivery:	Weekly contact: 2 hours lectures (x 5 weeks); 1 hour lecture (x 3 weeks); 1 hour seminar (x 3 weeks); 2 hours practical/skills training (x 3 weeks); 2 hour seminar (x 1 week); 2 hour feedback/revision session (x 1 week)			
	Scheduled learning: 25 hours		Guided independent study: 175 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 60%, Practical Examinations = 0%, Coursework = 40%			
	As used by St Andrews: Coursework = 40%, Written Examination= 60%			
Module Co-ordinator:	Prof E F Graham			
Lecturer(s)/Tutor(s):	Prof E F Graham			

GG3232 Housing, Community and Social-Spatial Justice				
SCOTCAT Credits:	20	SCQF Level 9	Semester:	1
Planned timetable:	To be arranged.			
This interdisciplinary module brings a Housing Studies perspective to the study of Urban Social Geography. Social geography is a sub-discipline that is interested in social relations and social difference. It has an analytical focus on the forms of power that lead to social and spatial inequality. Through engaging with contemporary policy and political debates about poverty and place, urban marginality and social-spatial (in)justice, this module emphasises the way in which geographical knowledge can be usefully applied to contemporary urban social 'problems'. In doing so, it also highlights how communities themselves have been active in leading place-based solutions to build better places.				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development			
Pre-requisite(s):	Passes at Grade 11 or better in GG2011 and GG2012, or in SD2001 and SD2002			
Learning and teaching methods and delivery:	Weekly contact: 1 x 1-hour lecture, 1 x 1-hour seminar (x 11 weeks) + 2 x 1-hour revision sessions			
	Scheduled learning: 22 hours		Guided independent study: 178 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 60%, Practical Examinations = 0%, Coursework = 40%			
	As used by St Andrews: 2-hour Written Examination = 60%, Coursework = 40%			
Module Co-ordinator:	Dr K McKee			
Lecturer(s)/Tutor(s):	Dr K McKee			

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GG3234 Migration and Transnationalism				
SCOTCAT Credits:	20	SCQF Level 9	Semester:	1
Planned timetable:	To be arranged.			
<p>This module is designed to advance students' appreciation of the chief academic arguments associated with migration and transnationalism. Geographical analysis of the changing role of labour migration in the world economy offers a distinctive perspective on this spatially, socially and economically selective process. Other new mobilities, such as the very significant increase in international student mobility, illustrate the complex ways in which globalisation interfaces with the efforts of individuals, families and communities to add to their social and cultural capital. Although dominantly concerned with international mobility, other scales of analysis will also be considered (e.g. the body). Finally, the course briefly covers issues associated with immigration, refugee and asylum policies.</p>				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development			
Pre-requisite(s):	Passes at Grade 11 or better in GG2011 and GG2012, or in SD2001 and SD2002			
Learning and teaching methods and delivery:	Weekly contact: 1 hour lecture and 1 hour seminar (x 10 weeks) + 2 x 1-hour essay feedback and exam revision sessions.			
	Scheduled learning: 22 hours		Guided independent study: 178 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework = 50%			
Module Co-ordinator:	Prof A M Findlay			
Lecturer(s)/Tutor(s):	Prof A M Findlay, Dr D McCollum			

GG3262 Climate and Weather Systems				
SCOTCAT Credits:	20	SCQF Level 9	Semester:	1
Planned timetable:	To be arranged.			
<p>Weather affects every aspect of life, and is a fundamental control on many environmental systems. This module explores the workings of the atmosphere at a wide range of scales, from the formation of clouds and raindrops, through thunderstorms and cyclones, up to large-scale circulation of the atmosphere. Beginning from first principles, key physical processes are introduced and used to develop a deep understanding of the earth's weather and climate. The module concludes with a critical examination of the climate change debate.</p>				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development, or - by arrangement - Environmental Geoscience			
Pre-requisite(s):	Passes at Grade 11 or better in GG2011 and GG2012			
Learning and teaching methods and delivery:	Weekly contact: 2 hours lectures and 2 hours seminars (x 5 weeks) + 2 x 1-hour essay feedback and exam revision sessions			
	Scheduled learning: 22 hours		Guided independent study: 178 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 60%, Practical Examinations = 0%, Coursework = 40%			
	As used by St Andrews: Written Examination = 60%, Coursework = 40%			
Module Co-ordinator:	Prof D I Benn			
Lecturer(s)/Tutor(s):	Prof D I Benn			

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GG3263 Glaciers and Glaciation				
SCOTCAT Credits:	20	SCQF Level 9	Semester:	1
Planned timetable:	To be arranged.			
<p>In recent years, concern has risen about the impact of climate change on glaciers and ice sheets, and the implications for sea level rise, natural hazards and water resources. This course critically evaluates these issues, and explores the fundamental glaciological processes required to understand them. The first part of the course focuses on how glaciers function and interact with climate, and covers glacier mass balance (snowfall and ice melt), hydrology, processes of glacier motion and ice dynamics. The second part then applies these principles to important issues, such as glacier lake outburst floods, water resources in glacier-fed river basins, the future of the Antarctic and Greenland Ice Sheets, and sea level change.</p>				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development, or - by arrangement - Environmental Geoscience			
Pre-requisite(s):	Passes at Grade 11 or better in GG2011 and GG2012			
Learning and teaching methods and delivery:	Weekly contact: 1 x 1-hour lecture, 1 x 1-hour seminar (x 11 weeks) + 1 x 1-hour revision session + 1 residential (two-day – 16 hours) field course during the semester.			
	Scheduled learning: 37 hours		Guided independent study: 163 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 60%, Practical Examinations = 0%, Coursework = 40%			
	As used by St Andrews: 2-hour Written Examination = 60%, Coursework = 40%			
Module Co-ordinator:	Prof D I Benn			
Lecturer(s)/Tutor(s):	Prof D I Benn			

GG3264 Oceans and Climate				
SCOTCAT Credits:	20	SCQF Level 9	Semester:	1
Planned timetable:	To be arranged.			
<p>The oceans play a key role in the global climate system. The aim of this module is to foster an understanding of: (1) changes in ocean circulation and climate, the possible mechanisms for such changes and the wider implications in terms of past, present and future global and regional climates; and (2) to provide an introduction to some of the research methods employed to determine oceanographic changes.</p>				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development, or - by arrangement - Environmental Geoscience			
Pre-requisite(s):	Passes at Grade 11 or better in GG2011 and GG2012			
Learning and teaching methods and delivery:	Weekly contact: 1 x 1-hour lecture, 1 x 1-hour seminar (x 11 weeks) + 1 x 1-hour revision session during the semester.			
	Scheduled learning: 23 hours		Guided independent study: 177 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 60%, Practical Examinations = 0%, Coursework = 40%			
	As used by St Andrews: Written Examination = 60%, Coursework = 40%			
Module Co-ordinator:	Dr W E N Austin			
Lecturer(s)/Tutor(s):	Dr W E N Austin			

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GG3301 Special Topic for Joint or Major Honours in Geography (Junior Honours)				
SCOTCAT Credits:	10	SCQF Level 9	Semester:	1
Availability restrictions:	Entry to a Joint or Major Honours programme in Geography.			
Planned timetable:	To be arranged.			
This module is designed to allow Joint or Major Honours students in their Junior Honours year to engage with the subject matter of a selected 20-credit optional module in Geography (GG3221 - GG3289) yet balance the workload across the four semesters of their Honours programme. Students complete the contact hours of their chosen module but undertake a separate assessment.				
Programme module type:	Compulsory for Joint Honours Geography Optional for all 'Geography with' degrees			
Pre-requisite(s):	Passes at Grade 11 or better in GG2011 and GG2012			
Learning and teaching methods and delivery:	Weekly contact: Students undertake the lecture/seminar contact hours associated with any 3000-level GG, SG or SD coded option module, but do a separate assessment (4000-word essay). Weekly contact hours vary (with the option module taken), but the average scheduled learning across the range of modules available is 23 hours.			
	Scheduled learning: 23 hours		Guided independent study: 77 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr D McCollum			
Lecturer(s)/Tutor(s):	Various			

GG3302 Special Topic for Honours in Geography (Senior Honours)				
SCOTCAT Credits:	10	SCQF Level 9	Semester:	1
Availability restrictions:	Entry to a Joint or Major Honours programme in Geography, or Single Honours Geography.			
Planned timetable:	To be arranged.			
This module is designed to allow Honours students in their Senior Honours year to engage with the subject matter of a selected 20-credit optional module in Geography (GG3221 - GG3289) yet balance the workload across the four semesters of their Honours programme. Students complete the contact hours of their chosen module but undertake a separate assessment.				
Programme module type:	Optional for Joint Honours Geography, all 'Geography with' degrees and Single Honours students also taking ID4001 or ID4002.			
Pre-requisite(s):	Passes at Grade 11 or better in GG2011 and GG2012			
Required for:	Single Honours Geography students also taking ID4001 or ID4002			
Learning and teaching methods and delivery:	Weekly contact: Students undertake the lecture/seminar contact hours associated with any 3000-level GG, SG or SD coded option module, but do a separate assessment (4000-word essay). Weekly contact hours vary (with the option module taken), but the average scheduled learning across the range of modules available is 23 hours.			
	Scheduled learning: 23 hours		Guided independent study: 77 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr D McCollum			
Lecturer(s)/Tutor(s):	Various			

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GG4201 Advanced Debates in Geography				
SCOTCAT Credits:	10	SCQF Level 10	Semester:	2
Planned timetable:	To be arranged.			
<p>This module extends and provides a summation of work undertaken in the geography Honours programme, providing students with an opportunity to reflect on the scope and diversity of geography as a discipline and to think holistically about their own learning. The module is structured around a set of readings and seminars that encourage student to study and debate important contemporary issues and debates within geography (e.g. climate change, globalisation, the nature of social inequality, the interface between nature and culture). It is examined with a single three-hour examination comprised of a mixture of seen and unseen exam questions. These address the nature of geography as a discipline and the way in which geographical reasoning has or might be applied to significant contemporary issues.</p>				
Programme module type:	Optional for Single Honours Geography and all 'Geography with' degrees			
Pre-requisite(s):	GG3201, SG3201			
Learning and teaching methods and delivery:	Weekly contact: 6 x 2-hour seminars during the semester.			
	Scheduled learning: 12 hours		Guided independent study: 88 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 100%, Practical Examinations = 0%, Coursework = 0%			
	As used by St Andrews: 2-hour Written Examination = 100%			
Module Co-ordinator:	Dr D W Clayton			
Lecturer(s)/Tutor(s):	Team taught			

GG4297 Joint Honours Research Dissertation in Geography				
SCOTCAT Credits:	30	SCQF Level 10	Semester:	2
Planned timetable:	To be arranged.			
<p>The research dissertation is the fundamental piece of independent work upon which the Geography degree is based. It provides students with the opportunity to design and undertake an independent, original piece of empirical research under the supervision of a member of staff. The dissertation is a substantial, independent piece of research that represents the culmination of both substantive and core training in Geography. (Guidelines for printing and binding dissertations can be found at: http://www.st-andrews.ac.uk/printanddesign/dissertation/)</p>				
Programme module type:	Compulsory for Joint Honours Geography			
Pre-requisite(s):	GG3202, SG3202		Anti-requisite(s):	GG4298
Learning and teaching methods and delivery:	Weekly contact: Up to 8 hours of guided study per student over the semester (one-to-one supervision, by arrangement with supervisor)			
	Scheduled learning: 8 hours		Guided independent study: 292 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Dissertation = 100%			
Module Co-ordinator:	Dr E Ferraro			
Lecturer(s)/Tutor(s):	Team taught			

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GG4298 Research Dissertation in Geography				
SCOTCAT Credits:	50	SCQF Level 10	Semester:	2
Planned timetable:	To be arranged.			
<p>The research dissertation is the fundamental piece of independent research work upon which the Geography degree is based. It provides students with the opportunity to design and undertake an independent, original piece of empirical research under the supervision of a member of staff. The dissertation is a substantial, independent piece of research that represents the culmination of substantive and core training in Geography. An important component of the dissertation is the annual Senior Honours Research Conference at which all students present their work to members of the school and to Junior Honours students in either oral paper sessions or scientific poster sessions. (Guidelines for printing and binding dissertations can be found at: http://www.st-andrews.ac.uk/printanddesign/dissertation/)</p>				
Programme module type:	Compulsory for Single Honours Geography, all 'Geography with' degrees			
Pre-requisite(s):	GG3201 or GG3203, SG3201 or SG3203	Anti-requisite(s):	GG4297	
Learning and teaching methods and delivery:	Weekly contact: Up to 8 hours of guided study per student over the semester (one-to-one supervision, by arrangement with supervisor), plus a 1 day (8-hour) conference			
	Scheduled learning: 16 hours		Guided independent study: 490 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Dissertation and Conference paper = 100%			
Module Co-ordinator:	Dr E Ferraro			
Lecturer(s)/Tutor(s):	Team taught			

GG4301 Advanced Study for Joint or Major Honours in Geography				
SCOTCAT Credits:	10	SCQF Level 10	Semester:	1
Planned timetable:	To be arranged.			
<p>This module is designed to allow Joint or Major Honours students in their Senior Honours year to engage with the subject matter of a selected 20-credit optional module in Geography (GG3221 - GG3289) yet balance the workload across the four semesters of their Honours programme. Students complete the contact hours of their chosen module but undertake a separate assessment, at 4000-level (an advanced essay).</p>				
Programme module type:	Optional for all degrees involving Geography except Single Honours			
Pre-requisite(s):	Entry to a Joint or Major Honours programme in Geography, and normally a pass in one of GG3202, GG3203, or SG3202, SG3203			
Learning and teaching methods and delivery:	Weekly contact: Students undertake the lecture/seminar contact hours associated with any 3000-level GG, SG or SD coded option module, but do a separate assessment (4000-word essay). Weekly contact hours vary (with the option module taken), but the average scheduled learning across the range of modules available is 23 hours.			
	Scheduled learning: 23 hours		Guided independent study: 77 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr D McCollum			
Lecturer(s)/Tutor(s):	Various			

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ID4442 Combined Research Project in Biology and Geology			
SCOTCAT Credits:	45	SCQF Level 10	Semester: Whole Year
Planned timetable:	To be arranged.		
<p>This module provides an individual research project on a topic spanning the biological and geological sciences which allows the student to pursue in depth a topic of personal interest. The student works largely independently of supervision and has the opportunity to demonstrate individuality, initiative and enterprise. The project will be supported by advisors in both Biology and Geology. Skills of planning and executing research are learnt, as well as the ability to work independently, and present the results orally and in dissertation form (up to 10,000 words). (Guidelines for printing and binding dissertations can be found at: http://www.st-andrews.ac.uk/printanddesign/dissertation/)</p>			
Programme module type:	Compulsory for BSc Honours programme in Biology and Geology		
Pre-requisite(s):	Admission to BSc Honours programme in Biology and Geology		
Learning and teaching methods and delivery:	Weekly contact: Individual supervision by member(s) of teaching staff		
	Scheduled learning: 20 hours	Guided independent study: 430 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 10%, Coursework = 90%		
	As used by St Andrews: Research proposal = 5%, Oral Presentation = 10%, Dissertation = 85%		
Module Co-ordinator:	Dr T Raub		
Lecturer(s)/Tutor(s):	Dr T Raub		

Sustainable Development (SD) modules

SD3221 Frontiers in Sustainability Research: Do Good Lives Cost the Earth?			
SCOTCAT Credits:	20	SCQF Level 9	Semester: 1
Planned timetable:	To be arranged.		
<p>Material wealth has arguably created a 'culture of surplus' through which the pursuit of improved personal well-being has involved ever greater consumption of material goods, leaving in its wake a legacy of environmental problems (Ryan and Deci 2001). Yet across the world, people have often reported having long and happy lives ('happy life years'), whilst consuming different levels of resources (Seaford 2011). The security of these resources varies enormously too with potential implications for well-being, and much of this security is changing with increasing global connectivity and shifts from subsistence to monetary economies (Fazey et al., 2011). This module draws on evidence and literature from across several disciplines (for example, geography, psychology, sociology, politics) to explore the relationship between personal well-being and planetary well-being (via environmental behaviour). It will look at and critically assess models of personal well-being and environmental behaviour, notions of the 'good' life, and behaving 'well'. It will also explore debates around responsibility for personal well-being and environmental behaviour, and how that is manifest in processes of policy-making.</p>			
Programme module type:	Optional for all degrees involving Sustainable Development or Geography		
Pre-requisite(s):	Passes at grade 11 or better in (SD2001 and SD2002) or (GG2011 and GG2012)		
Learning and teaching methods and delivery:	Weekly contact: 1 x 2-hour lecture (x 11 weeks), 3 x 2-hour seminars and 1 x 2-hour tutorial during the semester		
	Scheduled learning: 30 hours	Guided independent study: 170 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 60%, Practical Examinations = 10%, Coursework = 30%		
	As used by St Andrews: Coursework = 40%, 2-hour Written Examination = 60%		
Module Co-ordinator:	Dr L A Reid		
Lecturer(s)/Tutor(s):	Dr L A Reid		

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SD3237 Sustainability in Place: fieldclass in Ecuador			
SCOTCAT Credits:	20	SCQF Level 9	Semester: 1
Availability restrictions:	CANCELLED-Due to unforeseen problems of political unrest and government travel warnings Not available to General Degree Students.		
Planned timetable:	To be arranged.		
<p>This module prepares for, and culminates in a 2-week field class in Ecuador that includes: visits to sustainability projects; having a full immersion experience in indigenous communities; and engaging in conversations and activities with indigenous peoples around issues of environmental conservation, ethnic claims and sustainability in general. The module will involve conceptual engagement with the literature on “place” and its role in sustainability theories and practice, and critical reflection on indigenous knowledge, indigenous ways of knowing and the challenges they present to the sustainability scholarship. This will be accompanied by the opportunity to assess and experience, “in the field”, the relevance of these conceptual debates under the careful guidance of Ecuadorian indigenous leaders. Reflexive diary keeping will provide an opportunity for students to reflect on their own experience of learning that will then be articulated in a reflexive essay.</p>			
Programme module type:	Optional for Sustainable Development		
Pre-requisite(s):	Passes at grade 11 or better in (SD2001 and SD2002) and/or GG2012 and/or SA2002		
Learning and teaching methods and delivery:	Weekly contact: 1-hour lecture, 1-hour seminar (x 5 weeks) 2 weeks' fieldwork (80 hours) in total.		
	Scheduled learning: 90 hours	Guided independent study: 110 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%		
	As used by St Andrews: Coursework = 100%		
Module Co-ordinator:	Dr E Ferraro		

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SD4299 Dissertation in Sustainable Development			
SCOTCAT Credits:	60	SCQF Level 10	Semester: Whole Year
Availability restrictions:	Available only to students who intend an Honours Degree in Sustainable Development.		
Planned timetable:	To be arranged.		
<p>This module is largely based upon independent study. Students select a research question in Sustainable Development, mount a research programme to investigate the topic, and write a dissertation on the work. The topic is selected during the second semester of the junior honours year; data can be collected during the following vacation with data analysis and the writing of the dissertation taking place over both semesters of Senior Honours. Each student is supervised by a member of the teaching staff from an appropriate disciplinary area who will ensure that the topic chosen is viable and advise students on data collection and analysis. Students attend an introductory session at the start of semester 2, followed by a series of 'workshop' sessions covering aspects of research design and process during the semester. Individual tutorials are decided between the individual student and their supervisors. The dissertation will normally be based in the disciplinary area of the student's partner subject, but in recognition of the interdisciplinary nature of the field of study of sustainable development and of the SD Programme, the dissertation will itself be interdisciplinary to some extent. The dissertation is a maximum of 15,000 words in length. Students present their findings at a dissertation conference and write an abstract for inclusion into the conference handbook to convey their results to an academic audience.</p>			
Programme module type:	Compulsory for Sustainable Development		
Pre-requisite(s):	One of SD3201, SD3202, SD3203, SD3204, SG3201, SG3202, SG3203, SG3204		
Anti-requisite(s):	SD4002		
Learning and teaching methods and delivery:	Weekly contact: Up to 8 hours of guided study per student over the semester (one-to-one supervision, by arrangement with supervisor), plus a 1 day (8-hour) conference		
	Scheduled learning: 16 hours	Guided independent study: 584 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 5%, Coursework = 95%		
	As used by St Andrews: Dissertation and Conference Paper = 100%		
Module Co-ordinator:	Dr E Ferraro		
Lecturer(s)/Tutor(s):	Team taught		

Sustainable Geography (SG) modules

SG3201 Single Honours Research Design and Methodology Training (60)			
SCOTCAT Credits:	60	SCQF Level 9	Semester: 2
Availability restrictions:	Not available to General Degree Students.		
Planned timetable:	To be arranged.		
<p>This module occupies a central place in our field-based research-orientated degree. It prepares students to undertake their independent research dissertation and develops transferable professional skills useful beyond graduation. Students learn about research design and the collection of original empirical data through engagement with a series of problem-based issues in geography and sustainable development. Themes covered include: training in quantitative, qualitative, and physical research methods; ethics of research; statistical techniques; cartography; and GIS (Geographical Information Systems). There is opportunity for streaming and choice amongst units covering these themes. Skills and techniques learned are applied during a residential field course where students will design and execute an original empirical research project with a staff mentor. The module concludes with students producing an independent research proposal for their Senior Honours dissertation projects.</p>			
Programme module type:	Compulsory for Single Honours Geography and one of SG3201 - SG3204 is compulsory for Sustainable Development		
Pre-requisite(s):	Passes at Grade 11 or better in (GG2011 and GG2012) or (SD2001 and SD2002)	Anti-requisite(s):	SG3202, SG3203, SG3204, GG3201, SD3201
Required for:	GG4201, SG4221, SG4222, SG4223, SG4224, GG4298, SD4299, GG4301		
Learning and teaching methods and delivery:	Weekly contact: Varies according to the combination of elements (module units) chosen by the student. Average of 10 hours of classroom time (x 11 weeks), and a 1-week (40 hour) field class		
	Scheduled learning: 150 hours	Guided independent study: 450 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%		
	As used by St Andrews: Coursework = 100%		
Module Co-ordinator:	Dr D McCollum		
Lecturer(s)/Tutor(s):	Team taught		

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SG3202 Joint Honours Research Design and Methodology Training (30)			
SCOTCAT Credits:	30	SCQF Level 9	Semester: 2
Availability restrictions:	Not available to General Degree Students.		
Planned timetable:	To be arranged.		
<p>This module occupies a central place in our field-based research-orientated degrees. It prepares students to undertake their independent Joint Honours research dissertation and develops transferable professional skills useful beyond graduation. It is designed to prepare students for undertaking original, empirical research by introducing them to the general principles, methodologies, and methods used in the collection and generation of data. It prepares students to undertake their independent research dissertation, and provides transferable skills useful beyond graduation. Joint Honours students need to make an informed choice, with the help of their Advisor, to select from the units shared with the larger 60-credit SG3201. The module concludes with students producing an independent research proposal for their Senior Honours dissertation research.</p>			
Programme module type:	Compulsory for Joint Honours Geography One of SG3201 - SG3204 is compulsory for Sustainable Development		
Pre-requisite(s):	Passes at Grade 11 or better in (GG2011 and GG2012) or (SD2001 and SD2002)	Anti-requisite(s):	SG3201, SG3203, SG3204, GG3202, SD3202
Required for:	SG4221, SG4222, SG4223, SG4224, GG4297, GG4301		
Learning and teaching methods and delivery:	Weekly contact: Varies according to the combination of elements (module units) chosen by the student. Average of 10 hours (x 7.5 weeks).		
	Scheduled learning: 75 hours	Guided independent study: 225 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%		
	As used by St Andrews: Coursework = 100%		
Module Co-ordinator:	Dr D McCollum		
Lecturer(s)/Tutor(s):	Team taught		

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SG3203 Research Design and Methodology Training (50)			
SCOTCAT Credits:	50	SCQF Level 9	Semester: 2
Availability restrictions:	Not available to General Degree Students.		
Planned timetable:	To be arranged.		
<p>This module occupies a central place in our field-based research-orientated degrees. It prepares students to undertake their independent 50-credit research dissertation (GG4298) and develops transferable professional skills useful beyond graduation. Students will learn about research design and the collection of original empirical geographic data through engagement with a series of problem-based geographical issues. Themes covered include: the history and philosophy of geography; ethics of research; statistics for geographers; cartography; GIS; and quantitative, qualitative and physical research methods. Students are also required to attend an overseas field course. There is opportunity for streaming and choice amongst units covering these themes, and Major Honours students will need to make an informed choice, with the help of their advisor, to select from the units shared with the larger 60-credit GG3201. The module concludes with students producing an independent research proposal for their Senior Honours dissertation research.</p>			
Programme module type:	Compulsory for Geography with Social Anthropology, Geography with Spanish One of SG3201 - SG3204 is compulsory for Sustainable Development		
Pre-requisite(s):	Passes at grade 11 or better in GG2011 and GG2012	Anti-requisite(s):	SG3201, SG3202, SG3204, GG3203, SD3203
Required for:	GG4201, SG4221, SG4222, SG4223, SG4224, GG4298, SD4299, GG4301		
Learning and teaching methods and delivery:	Weekly contact: varies according to the combination of elements (module units) chosen by the student. Average of 10 hours (x 8.5 weeks), and a 1-week (40 hour) field class.		
	Scheduled learning: 125 hours	Guided independent study: 375 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%		
	As used by St Andrews: Coursework = 100%		
Module Co-ordinator:	Dr D McCollum		
Lecturer(s)/Tutor(s):	Team taught		

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SG3204 Method, Field , Data: Research Training (40)				
SCOTCAT Credits:	40	SCQF Level 9	Semester:	2
Availability restrictions:	Not available to General Degree Students.			
Planned timetable:	To be arranged.			
This module is a core research design and methods training module. It is organised around a series of problem-based learning units where introductory lectures lead onto the practical implementation of particular methods. The focus is on the collection and generation of data which then leads onto the rigorous analysis of data in Senior Honours. It includes a week-long research-based fieldclass organised around the design and implementation of a specific research project. The module provides fundamental training for the independent Senior Honours dissertation project.				
Programme module type:	One of SG3201 - SG3204 is compulsory for Sustainable Development			
Pre-requisite(s):	Passes at grade 11 or better in SD2001 and SD2002	Anti-requisite(s):	SG3201, SG3202, SG3203, SD3204	
Required for:	SG4221, SG4222, SG4223, SG4224, GG4298, SD4299, GG4301			
Learning and teaching methods and delivery:	Weekly contact: Varies according to the combination of elements (module units) chosen by the student. Average of 10 hours (x 8 weeks) plus a 3-day fieldclass.			
	Scheduled learning: 104 hours		Guided independent study: 296 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 15%, Coursework = 85%			
	As used by St Andrews: Coursework = 100% Each unit in the module will have different forms of coursework assessments. In addition, students will have to produce a group presentation, based upon the work done during the fieldclass, which will be individually assessed.			
Module Co-ordinator:	Dr D McCollum			
Lecturer(s)/Tutor(s):	Team taught			

SG3229 Environmental Management in Scotland				
SCOTCAT Credits:	20	SCQF Level 9	Semester:	1
Planned timetable:	To be arranged.			
This module explores current environmental management issues in Scotland. It discusses the primary sectors of land & resource management (e.g. forestry, agriculture, wildlife management, freshwater resource management, conservation, renewable energy), and explores how these systems interact. The aim is to leave students with an informed conceptual and empirical framework for evaluating management proposals and their implications for environmental, economic and social change. A particular focus, employing topical case studies and a field visit, is the conflicts that arise as interest groups with contrasting philosophies & value systems compete to shape the future of Scotland's natural heritage within a devolved political framework and in the context of climate change.				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development			
Pre-requisite(s):	Passes at grade 11 or better in (GG2011 and GG2012) or (SD2001 and SD2002)			
Learning and teaching methods and delivery:	Weekly contact: 1 x 2-hour lecture (x 10 weeks) + 2 x 1-hour feedback/revision sessions and a 1-day (8 hour) field excursion.			
	Scheduled learning: 30 hours		Guided independent study: 170 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 60%, Practical Examinations = 20%, Coursework = 20%			
	As used by St Andrews: 2-hour Written Examination = 60%, Practical Examination = 20%, Coursework = 20%			
Module Co-ordinator:	Dr C R Warren			
Lecturer(s)/Tutor(s):	Dr C R Warran			

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SG3272 Long-term Perspectives on Sustainability				
SCOTCAT Credits:	20	SCQF Level 9	Semester:	1
Planned timetable:	To be arranged.			
<p>This module examines how long-term perspectives on human-environment interactions can inform modern understandings of sustainability. Although sustainability is a modern concern, many of its problems are very similar to those faced by societies in the past: climatic change, resource degradation, extreme events, conflict and natural hazards. This module illustrates how we can investigate past human-environment interactions through careful consideration of palaeoenvironmental data, and then consider how this can be used to understand how past societies coped, or failed to cope, with a range of problems. This idea will be illustrated with a range of case studies across the North Atlantic islands and the Pacific islands.</p>				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development			
Pre-requisite(s):	Passes at grade 11 or better in (GG2011 and GG2012) or (SD2001 and SD2002)			
Learning and teaching methods and delivery:	Weekly contact: 1-hour lecture, 1-hour seminar (x 10 weeks), 6 office hours over semester.			
	Scheduled learning: 26 hours		Guided independent study: 174 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 60%, Practical Examinations = 0%, Coursework = 40%			
	As used by St Andrews: 2-hour Written Examination = 60%, Coursework = 40%			
Module Co-ordinator:	Dr R Streeter			
Lecturer(s)/Tutor(s):	Dr R Streeter			

SG3274 Landscape Ecology and Sustainability Science				
SCOTCAT Credits:	20	SCQF Level 9	Semester:	1
Planned timetable:	To be arranged.			
<p>Landscape ecology provides an integrative theoretical basis and a suite of technical tools for understanding biophysical and socio-economic phenomena in diverse landscapes, as well as for biodiversity conservation, ecosystem management, landscape planning and design, and sustainability science. Landscape ecology is a growing profession in the UK and overseas. Working at the landscape scale is now integral to the UK land use planning system and is increasingly emphasised in the sphere of land management. Implementing environmental policies and strategies on the ground needs to take a wide range of factors into consideration. A holistic vision and practical tools are needed to integrate those factors to reach sustainable solutions. The course focuses on applied case studies providing the views and experiences of practitioners and scientists coming from a range of institutions in Scotland (e.g. CEH, James Hutton Institute, Centre for Mountain Studies) and France (IRSTEA).</p>				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development			
Pre-requisite(s):	Passes at grade 11 or better in (GG2011 and GG2012) or (SD2001 and SD2002)			
Learning and teaching methods and delivery:	Weekly contact: 1-hour lecture, 1-hour seminar (x 9 weeks), 6 office hours over the semester			
	Scheduled learning: 24 hours		Guided independent study: 176 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr S Luque			
Lecturer(s)/Tutor(s):	Dr S Luque, Prof M Price, Pro A Hester			

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SG4221 Review Essay				
SCOTCAT Credits:	20	SCQF Level 10	Semester:	1
Planned timetable:	To be arranged.			
<p>This elective requires students, working independently, to identify and critically review a body of literature, giving an account of its substantive content, and critically assessing the evidence on which it is based. Students can either identify an intellectual field that lies outside those addressed in available 3000-level options modules, or build on a field covered in the programme, pursuing it at greater depth. In addition to supervisory sessions and module tutorials, students may also attend sessions in a relevant 3000-level option module running in the same semester.</p>				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development			
Pre-requisite(s):	Passes in one of SG3201, SG3202, SG3203, SG3204, GG3201 - GG3204, SD3201 - SD3204			
Learning and teaching methods and delivery:	Weekly contact: Introductory lecture and seminar (2 hours) followed by guided independent study (one-to-one supervision)			
	Scheduled learning: 2 hours		Guided independent study: 198 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Prof C Ballantyne			
Lecturer(s)/Tutor(s):	Team taught			

SG4222 Advanced Qualitative Analysis				
SCOTCAT Credits:	20	SCQF Level 10	Semester:	1
Planned timetable:	To be arranged.			
<p>This module offers advanced training in methods of qualitative analysis that facilitate dissertation work and develop transferable skills for future careers. Learning is project/problem-based, and students gain practical experience of working with a range of qualitative data (e.g. archives, visual and textual documents and interview transcripts) using a range of analytical approaches (e.g. discourse analysis, deconstruction, grounded theory and computer-assisted qualitative analysis). Research data are drawn from a range of areas within geography and sustainable development. . Techniques, themes and materials will vary according to staff availability.</p>				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development			
Pre-requisite(s):	Passes in one of SG3201, SG3202, SG3203, SG3204, GG3201 - GG3204, SD3201 - SD3204			
Learning and teaching methods and delivery:	Weekly contact: 1-hour seminar (x 12), 1 hour lecture (x 7), 1 x 2-hour practical, 3 x 1-hour practical, 2 seminars and 2 practical classes.			
	Scheduled learning: 22 hours		Guided independent study: 178 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr K McKee			
Lecturer(s)/Tutor(s):	Team taught			

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SG4223 Advanced Quantitative Analysis				
SCOTCAT Credits:	20	SCQF Level 10	Semester:	1
Planned timetable:	To be arranged.			
<p>Students taking this module will learn some of the core research skills necessary to be a professional quantitative social science researcher and then to carry out a typical consulting project. It will allow them to explore a substantive policy issue, carry out their own quantitative research and then make recommendations based on these findings. They will be presented with a 'real world' scenario and be expected to take on the role of a researcher who is advising policy makers; in simulations of various policy forums, they will then learn how to defend their recommendations and advice. They will first be taught the relevant quantitative research skills and introduced to potentially useful research resources. They will then be expected to construct their own research strategy, carry out the necessary research and present this in various formats, working independently of the teaching staff.</p>				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development			
Pre-requisite(s):	Passes in one of GG3201, GG3202, GG3203, SD3201 - SD3204, SG3201 - SG3204			
Anti-requisite(s):	GG4223, SD4223			
Learning and teaching methods and delivery:	Weekly contact: 2-hour lectures, 2-hour seminars, 1-hour practical classes each week for 7 weeks, and occasional tutorials.			
	Scheduled learning: 38 hours		Guided independent study: 162 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 13%, Coursework = 87%			
	As used by St Andrews: Practical Examination = 13%, Coursework = 87%			
Module Co-ordinator:	Dr Z Feng			
Lecturer(s)/Tutor(s):	Team taught			

SG4224 Advanced Topics in Physical Sciences				
SCOTCAT Credits:	20	SCQF Level 10	Semester:	1
Planned timetable:	To be arranged.			
<p>This module introduces students to a range of advanced and cutting edge topics in Physical Geography and other physical sciences relevant to geography and sustainable development. Four topics are offered each year that build on material explored in 3000-level Honours modules, and which expand and deepen students' practical skill set. Students choose two of the four topics. Each topic includes in-depth study of the primary literature, combined with advanced training in analytical, technical or methodological approaches, thus integrating "hands-on" applied learning with critical reading of the primary literature. The module complements and expands the learning acquired in SG3201-SG3204, and provides additional resources for the development of students' individual dissertation projects.</p>				
Programme module type:	Optional for all degrees involving Geography or Sustainable Development			
Pre-requisite(s):	Passes in one of SG3201, SG3202, SG3203, SG3204, GG3201 - GG3204, SD3201 - SD3204			
Anti-requisite(s):	GG4224, SD4224			
Learning and teaching methods and delivery:	Weekly contact: 2 hour lectures (x 9 weeks) and 1 x 1/2-day (4 hour) field class.			
	Scheduled learning: 22 hours		Guided independent study: 178 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Module Co-ordinator:	Dr R Streeter			
Lecturer(s)/Tutor(s):	Team taught			

