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School of Earth and Environmental Sciences

Second Year Handbook

Academic Year
2018/2019



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Welcome back to Earth and Environmental Sciences at St Andrews

This handbook provides information on the 2nd-Year course within the School of Earth and Environmental Sciences. Please read it carefully; it addresses aspects of the organisation and content of the programme and modules, and indicates what is expected of you. It is also important that you refresh your understanding of the University's regulations that govern your degree, and these can be found in the **University's Student Handbook**:

<http://www.st-andrews.ac.uk/studenthandbook/>

Check Moodle and your email accounts regarding timetabling, lecture and practical times, as well as the time and dates of fieldtrips. Owing to various circumstances, the timing of trips and lectures may be changed and it is up to you to make certain you check regularly the noticeboards and email for any such updates. Recall that you are expected to **check your e-mail daily** for messages from staff about the modules (*University policy is that email must be checked every 48 hours*).

Also recall that general enquiries about the programme should be directed to the Sub-Honours Co-ordinator, **Dr Catherine Rose** (Rm 424: Irvine Building, Tel: ex-2874; e-mail: cvr@st-andrews.ac.uk). Questions about a particular part of any module should be raised in the first instance with the lecturer. The Course Secretary is Lesley-Anne Harrison (Rm 211, Tel: ex-3940; e-mail: lb35)

Your 2nd year Earth Sciences Modules are:

- **ES2001: Dynamic Earth: The Earth System** (Semester 1)
 - Module coordinator: Professor Richard White (rww3@)
- **ES2002: Dynamic Earth: Magma, Minerals, and Metamorphism** (Semester 2)
 - Module coordinator: Professor Richard White (rww3@)
- **ES2003: Dynamic Earth: Earth Surface Processes** (Semester 2)
 - Module coordinator: Dr Nicola Allison (na9@)
- **ES2004: Practical & Field Skills for Earth Sciences (Direct Entrants)** (Whole Year)
 - Module coordinator: Dr Catherine Rose (cvr@)

A Brief Reminder

You are now part of a proud and long tradition of scientists studying the development of our planet. For more than 200 years, graduates of St Andrews have made significant contributions to earth science. This tradition continues today and you will define it in the future.

A full list of School staff can be found at: <https://earthsci.st-andrews.ac.uk/staff/>

Make certain that your voice is heard through the **Student-Staff Council**, chaired by your Student President and the colleagues you have elected as representatives. It meets twice a semester with members of academic staff and reports directly to the Earth and Environmental Sciences Teaching Council. The School's External Examiner, Dr Helen Williams of Cambridge, reviews all minutes from the SSC twice a year (January and May).

Laboratory sessions will continue to be held in room C21 of the Bute. Your lectures, though, will be scheduled in or near to the **Irvine Building** where all staff and the main School office are located. Room C21 **Bute Building** and the IT lab in Irvine can be used anytime during normal working hours (09:00–17:00, Monday–Friday) when these are not being used for teaching. The latter has 24/7 access with your student swipe card during term time.

Lecture notes, handouts, and supplementary material for 2nd-Year modules will be made available on associated Moodle sites. Lecturers will make every effort to upload lecture notes soon after a lecture is delivered.

We hope you enjoy the 2000-level modules and continue to be inspired by the study of the Earth. Good luck with your studies.

Earth and Environmental School Roles

Role	Contact	<u>e-mail</u>	<u>extension</u>
Head of School of Earth & Environmental Science	Professor Tony Prave	ap13	2381
Director of Teaching	Dr Rob Wilson	rjsw	3914
Director of Postgraduate Studies	Dr Aubrey Zerkle	az29	4949
Sub-Honours Advisor & Co-ordinator	Dr Catherine Rose	cvr	2874
Academic Misconduct Officer	Professor Tony Prave	ap13	2381
BSc Geology Degree Programme Coordinator	Professor Richard White	rww3	4944
BSc Environmental Earth Science Degree Programme Coordinator and Adviser	Dr Nicola Allison	na9	3952
MGeol Degree Programme Coordinator	Professor Adrian Finch	aaf1	2384
S coding requests	Dr Rob Wilson	rjsw	3914
Honours student support and advice	Dr Nicky Allison	na9	3952
Disability Co-ordinator	Mrs Lesley-Anne Harrison	lb35	3940
Examinations Officer	Professor Adrian Finch	aaf1	2384
Director of Research	Dr Tim Raub	timraub	4012
Health & Safety Officer	Stuart Allison	sga	4949
Course Secretary (working hours 9:30am to 2:30pm)	Lesley-Anne Harrison	lb35	3940

The School Office (Rm 211, Irvine Building) is open Monday to Friday, 9am to 5pm.

2nd Year Earth and Environmental Science: Aims, Learning Outcomes and Key Skills

As you learned in 1st-Year studies, Earth and Environmental Sciences utilise the theory and techniques of geology, geophysics and geochemistry to study and determine the nature, rates and durations of processes operating in the deep Earth, its surface and near surface; and their interactions with the atmosphere, hydrosphere and biosphere through time. Our overall goal is to provide you with the skills to competently and confidently assess and interpret natural processes and through that formulate an understanding of how the Earth System functions. Your 2nd-Year studies focus on providing a deeper and broader geological and environmental knowledge from which to develop critical, analytical and independent thinking regarding the nature and character of processes operating within the Earth System.

The progressive nature of the degree programmes means that we expect you to have retained the information and skills you learned in 1st-Year studies. Thus, the goals of 2nd-Year Earth and Environmental Sciences are to enhance those you have already acquired by:

- Providing greater depth and breadth in the concepts and principles of Earth Sciences via training in core subjects of structural geology, sedimentology, stratigraphy, palaeontology, geophysics, igneous petrology, mineralogy, metamorphism and tectonics.
- Exploring in more detail how the physical processes operating within the Earth System mutually interact and function.
- Expanding the range of geological training and experience through a series of focussed field courses.
- Increasing your competence and confidence in observing, recording and interpreting geoscientific data by integrating lecture and lab material through field-based studies.
- Improving your analytical skills and ability to think critically by requiring you to utilise quantitative and qualitative methodologies in problem solving.
- Continuing to augment your transferable skills, including critical thinking, independent learning, team-building and computer skills. Career awareness is developed through attendance at an Earth Science Careers Event in Edinburgh and a session delivered by the Careers Centre on “Future options with your degree”.

The Structure of Second Year

The School offers the following 2nd-Year modules:

- **ES2001: Dynamic Earth: The Earth System** (Semester 1)
 - Module coordinator: Professor Richard White (rww3@)
- **ES2002: Dynamic Earth: Magma, Minerals, and Metamorphism** (Semester 2)
 - Module coordinator: Professor Richard White (rww3@)
- **ES2003: Dynamic Earth: Earth Surface Processes** (Semester 2)
 - Module coordinator: Dr Nicola Allison (na9@)
- **ES2004: Practical & Field Skills for Earth Sciences (Direct Entrants)** (Whole Year)
 - Module coordinator: Dr Catherine Rose (cwr@)

For students taking BSc Geology or Environmental Earth Science or MGEOL degrees, you must take ES2001, ES2002 and ES2003. Joint Honours degrees students usually take ES2001 and either ES2002 or ES2003. ES2004 is for students who have obtained direct entry into 2nd Year. If you are unsure which degree to pursue, please seek advice from one of the Programme Advisers (Richard White (Geology), Nicky Alison (Environmental Earth Science) and Adrian Finch (MGEOL)).

ES2001: The Earth System

This module focuses on the behaviour of the solid Earth and its interaction with the hydrosphere, atmosphere and biosphere. It will provide training in some of the processes acting at or near the Earth's surface (*e.g.* the dynamics of erosional processes); offer a deeper understanding of the evolution of the planet as a whole (including the evolution of life), from primordial magma oceans to modern day climate change; and deliver practical and theoretical training in geophysical methods for probing the near surface of the Earth. Practical classes will be associated with each of the main topic areas introduced in the lectures.

Fieldwork and practical elements of the module (time and dates will be available on the semester timetable and Moodle)

Fieldwork will involve two one-day excursions to outstanding coastal exposures:

St Monans: to focus on structural mapping techniques and analysis. The objective is to ensure that you are confidently and efficiently using a compass-clinometer, and transferring the information accurately to a base map.

Pittenweem: to train you in describing and interpreting sedimentary rocks in the field. You will independently measure, log and describe sedimentary facies and formulate hypotheses for the geological features you observe.

Note that any material discussed, or observations made, during the field excursions may be assessed during practical exams or end-of-term exams.

Lab Support Sessions: There will be fortnightly sessions on Wednesdays 2-4 pm in C21 Bute to review any practical material. These sessions are optional and self-directed but there will be a member of staff present for the duration to answer your questions. See timetable for dates of these sessions.

The Annual Earth Sciences Careers Event

This event is held yearly at *Our Dynamic Earth* in Edinburgh in November (details to be e-mailed). Over 200 students from across northern Britain meet industry professionals and postgraduate students pursuing upper level degrees. This is a superb networking opportunity and provides insight into what Earth science jobs are really like.

Assessment for ES2001

Assessment is based upon 50% continuous assessment and 50% on a final examination.

Continuous Assessment (50% of module mark)

- Assessment 1 (10%): St Monans field notebook and write up.
- Assessment 2 (10%): Pittenweem field notebook and write up.
- Assessment 3 (20%): Three-hour, open-book practical exam on the material covered in the lab and field classes.
- 8x Earth Science Techniques Quizzes (10%): ~5 minute-long, auto-marked Moodle quizzes based on Techniques and Numeracy tutorials delivered weekly by Laura Crick

Final Assessment - End of Module Exam (50% of module mark)

A written examination will be given at the end of the module; it will be two hours long, closed book and consist of a short-answer section (40%) and an essay-style section (60%).

Full details of the assessments and the various deadlines will be given by your lecturers. Examples of past exam scripts for ES2001 are available from MySaint at:

<http://www.st-andrews.ac.uk/students/academic/examinations/pastpapers/>

Finally, you will be expected to read and be conversationally familiar with cutting-edge scientific papers. These will be posted on Moodle.

ES2002: Dynamic Earth: Magma, Minerals and Metamorphism

This module focuses on the geology and geochemistry of the solid Earth and high temperature processes in the Earth's interior focusing on the mineral building blocks of the Earth as well as volcanic and metamorphic processes and geodynamics. A key component is the residential central Spain field excursion, where independent field mapping will be introduced. Topics covered will focus upon structural and tectonic geology, mineralogy, metamorphism and igneous processes. Practical classes will be associated with all of the key topics in preparation for this excursion.

Fieldwork

The one-day and residential excursion dates will be announced during Semester 1 and will be posted on the timetable and through Moodle. *Note that any material discussed, or observations made, during the field excursion may be assessed during the practical or end-of-term exam.*

Elie: This one-day excursion examines pyroclastic rocks and associated intrusions that are excellent examples of the key processes in the formation of the explosive Late Carboniferous volcanoes of eastern Fife. Measurement of volcanic and structural data will be taken and plotted on a map to determine the form of the bedding across the neck.

Spain Geological Mapping: An 8-day residential field excursion to central Spain held during Easter vacation is a compulsory part of this course. The cost of this trip will be covered by the School. However, students are responsible for booking and paying their own return flight home.

Fieldwork Prizes will be awarded to the top three student marks of the excursion.

Spain will be your first truly 'independent' bit of fieldwork; your interpretations will be based on the observations and measurements you make. For safety, you will work in a mapping group of four people and several members of staff will supervise the fieldwork.

The trip has three main goals aimed at enhancing:

- your skills in geological fieldwork through the experience of working in varied terrain on a variety of rocks that have undergone polyphase deformation, *i.e.* a 'complete' geological experience;
- your self-confidence and ability to competently apply the scientific method to solve problems using critical observation and testing of hypotheses;
- your ability to work both independently and within a group, and your time management skills.

Many non-Earth scientists are envious of the fact that our 'laboratory' is nature, and that our profession takes us to exotic places. By being able to experience different places and different cultures, you grow as a person. When you can include 'doing science' as part of that experience, you grow as a scientist. This trip affords you the opportunity to do both.

Practicals

There will be fortnightly lab support sessions on Wednesdays 2-4 pm in C21 Bute to review any practical material. These sessions are optional and self-directed but there will be a member of staff present for the duration to answer your questions. See timetable for dates of these sessions.

Assessment for ES2002

The assessment for ES2002 is based upon 50% continuous assessment during the module and 50% on a final examination.

Continuous Assessment (50% of module mark)

- Assessment 1 (30%): Spain geological maps, notebook, stereonets and geological history.
- Assessment 2 (20%): Two-hour, open-book practical exam on the material covered in the labs and field excursions

Final Assessment - End of Module Exam (50% of module mark)

This is a 2-hour long, closed-book written examination at the end of the module; it will consist of a short-answer section (40%) and an essay-style section (60%).

Full details of the assessments and the various deadlines will be given by your lecturers. Examples of past exam scripts for ES2002 are available from MySaint at:

<http://www.st-andrews.ac.uk/students/academic/examinations/pastpapers/>

ES2003: Dynamic Earth: Earth Surface Processes

This module focuses on the low temperature processes that occur in the outer envelopes of the Earth, including land-atmosphere interactions, glacial processes, tectonic geomorphology, geomicrobiology and oceanography. Relationships between physical, chemical and biological processes occurring along Earth's surface, and their impact on climate, will be explored using case studies. A key component of this course will be fieldwork to sites of environmental interest developing field skills in water/sediment sampling and analysis, and unravelling contaminant flow-patterns. Practical classes and tutorials will be associated with all of the key topics.

Fieldwork

A 6-day field course in Yorkshire exploring the varying sources of iron, nitrate and phosphate levels on river systems and their impact on pH and invertebrate life. Students will learn the field skills associated with environmental Earth science research, including recording physical, chemical and biological field observations as well as undertaking basic statistical analyses to test varying hypotheses.

Practicals

There will be fortnightly lab support sessions on Wednesdays 2-4 pm in C21 Bute to review any practical material. These sessions are optional and self-directed but there will be a member of staff present for the duration to answer your questions. See timetable for dates of these sessions.

Assessment for ES2003

The assessment for ES2003 is based upon 50% continuous assessment during the module and 50% on a final examination.

Continuous Assessment (50% of module mark)

- Assessment 1 (30%): Field excursion reports.
- Assessment 2 (20%): Two-hour, open-book practical exam on the material covered in the labs and field excursions

Final Assessment - End of Module Exam (50% of module mark)

This is a 2-hour long, closed-book written examination at the end of the module; it will consist of a short-answer section (40%) and an essay-style section (60%).

Full details of the assessments and the various deadlines will be given by your lecturers. Examples of past exam scripts for ES2003 are available from MySaint at: <http://www.st-andrews.ac.uk/students/academic/examinations/pastpapers/>

ES2004 Practical and Field Skills for Earth Sciences

This module is only available to students who have been accepted for direct 2nd-Year entry to an Earth Science degree programme. It provides basic practical and fieldwork skills that are not taught at school and which characterise University-taught, accredited Earth Science programmes. Students will take part in Level 1 practicals and fieldwork and apply those skills to the core Level 2 programme. The students will also attend those aspects of the lecture programme in ES1001 and ES1002 that are not covered in A-level or Higher curricula. The learning in this module will supplement and complement other core Level 2 teaching.

Themes

The practical sessions in Semester 1 focus on mineral, igneous, metamorphic and sedimentary rock identification and classification in hand specimens and thin sections. Those in Semester 2 focus on the identification and classification of fossils, how to interpret geological maps, and natural resources. Concepts covered in the practicals are reinforced during field excursions.

The excursions are to local Carboniferous exposures in Fife around Elie, at the Rock and Spindle near Kinkell Braes, and near Kinkell Braes itself. ES2004 students do not need to attend the Highland Fling field excursion. Please refer to the courses descriptions for ES1001 and ES1002 for further information. See the Timetable and Notice Board for times and dates.

Assessment of ES2004

The assessment for ES2004 is based **on 100% coursework**:

- Group project Report and Poster (25%)
- Two open-book practical exams (each 2 hours long) on the material covered in the labs and field excursions; held during the last week of classes in each semester (69%)
- Kinkell Braes excursion (6%)

Other matters

Required Reading for Second-Year

2nd-Year studies require you to obtain breadth and depth across several disciplines of the Earth Sciences. Thus, you need to consult and read from numerous textbooks. We recognise that books are expensive, but keep in mind that many of those listed below will be useful in Honours and may be available second-hand from other students. These and other useful texts can be found in the Main Library. Consult individual lecturers for additional texts or readings.

Clarkson, E.N.K. 1998. *Invertebrate Palaeontology and Evolution*, 4th Ed. Blackwell.

Woodcock, N. & Strachan, R. 2000. *Geological History of Britain and Ireland*. Blackwell.

Coe, A. 2010. *Geological Field Techniques*. Wiley-Blackwell.

Davis, G.H. & Reynolds, S.J. 1996. *Structural Geology of Rocks & Regions*, 2nd Ed. Wiley.

Tucker, M. E. 2003. *Sedimentary Rocks in the Field*, 3rd Ed. John Wiley & Sons.

Woodcock, N. 1994. *Environmental Geology of Britain and Ireland*. UCL Press.

Best, M.G. 2002. *Igneous and Metamorphic Petrology*. Blackwell.
Marshak, S. 2011. *Earth: Portrait of a Planet*. Norton Press.
McKenzie, W.S. & Guilford, A.E. 1994. *A Colour Atlas of Rocks and Minerals in Thin Section*. Manson.
Coe, A 2010. *Geological Field Techniques*. Wiley-Blackwell.
Kump, L.R., Kasting, J.F. & Crane, R.G. 2011. *The Earth System*. Pearson Education. [QH331.K8G11].

You also should get in the habit of browsing the professional literature in general earth sciences, and in specialty sub-disciplines which interest you. The best way to do this is to schedule 1 hour per week in your free time for visiting several journal websites. Skim article titles, looking for topics or places that catch your eye. Pay particular attention to the abstract, conclusion, figures, and captions. Note which are the home institution(s) of the study author(s).

Journals that tend to publish “chicken nugget” papers which are intended to be read and essentially understood by a broad scientifically-trained audience include: *Science*, *Nature*, *Nature Geoscience*, *Geology*, *Terra Nova*, *Palaios*, *Proceedings of the National Academy of Sciences (USA)*, and *Journal of the Geological Society*. The University has online subscriptions to all of these journals.

Automatic Entry to Honours

Students who attain an average of 11.0 or above at first sitting for all 2nd year modules, and who meet all other programme requirements, will be given automatic offers into Honours programmes. They will be permitted to trail more than one module or 30 Sub-Honours credits into Honours.

Students who attain an average of 15.0 or above at first sitting in all requisite 2000 level modules in accordance with the programme rules, and who meet all other programme requirements, will be given automatic offers into the Integrated Masters programme. They will not be permitted to trail any Sub-Honours credits into Honours.

Qualified Entry to Honours

Students who do not achieve automatic Honours Entry as outlined above and wish to enter Honours must:

- a) be eligible for reassessment in the relevant requisite 2000 level modules with grades between 4.0 and 10.9
- b) take the requisite entrance examinations and achieve a grade of 11 or above in the module(s) retaken, while also meeting the original Honours Entry requirements (e.g. where an average of two or more grades is required).

Qualified entry is not permitted to Integrated Masters programme.

Students are not permitted to trail any credits on a qualified entry route.

<http://www.st-andrews.ac.uk/media/teaching-and-learning/policies/HonsEntry.pdf>

Requests for Review of Decision for Entry to Honours

Students who fail to meet the requirements for entry to honours and are consequently refused entry to their chosen degree programme and are eligible to request a review of the decision. For additional information and a list of admissible grounds for requesting a review please see <https://www.st-andrews.ac.uk/media/teaching-and-learning/policies/HonsReview.pdf>

Last Words

You are now in your second year of studies. Your confidence and interests are burgeoning (hopefully!) and you most likely want to advance into Honours. To date, most of your education has focused largely on knowing things. However, in Honours, simply knowing about things is not sufficient.

One of the foremost astrophysicists ever, Carl Sagan, was once asked what he considered to be the most important trait for a scientist. Without hesitation he replied: "*A healthy scepticism.*" Dick Jahns, an eminent geologist of the 20th century, candidly remarked about a field area he had studied his entire life: "*I only wish I understood everything I knew about those rocks.*"

Two enormously respected scientists making two simple but rather profound statements. You may *know* a lot of information, but how much of it do you truly *understand*? Question everything! The wisdom of these scientists should inspire you to **independently** and **critically** evaluate ideas and interpretations in order to really understand how things work.

Sub-Honours Marking Scheme

In accordance with normal practice amongst the physical sciences at St Andrews, **your work will be marked as a %** and this will appear on the returned work. The % marks from each of the assessments in the module will be amalgamated to provide a weighted mean %. However, the University logs final marks from modules across the disciplines using a 20-point scale, and hence we will convert your overall module % mark to the 20-point reporting scale in a predefined way called the “Earth Sciences Sub honours Translation Function”. The relationship between % and 20-point reporting scale is given below.

<u>Percentage mark</u>	<u>Grade</u>
85 – 100	20
80 – 84.9	19 - 19.9
70 – 79.9	17.0 – 18.9
60 – 69.9	13.0 – 16.9
55 – 59.9	11.0 – 12.9
45 – 54.9	7 – 10.9
32 – 44.9	4 – 6.9
< 32	< 3.9

* In accordance with standard educational practice, a particular exercise may use a different conversion in the light of class performance and/or moderation by the External Examiner. In that case, it may be appropriate to have a different correspondence between % and the Sub Honours classification.

The precise conversion is made as follows:

PERCENTAGE	GRADE POINT
85 - 100	20
70 – 84.9	Multiply % by 0.20 and add 3
40 – 69.9	Multiply % by 0.40 and subtract 11
0 – 39.9	Multiply % by 0.125

In accordance with University policy, the result of each module will be awarded a Scale Point from 1 – 20; Registry will notify you of this after the Examination Diet. In Earth Science most coursework is marked as a percentage and then converted to a scale point and returned work will normally show both.

If you have done modules in other physical sciences, you may find that their conversions between % to 20-point scale are different to ours - this is because it is easier in some disciplines to obtain high marks (such as maths where 100% marks are common!). The use of the 20-point reporting scale and the different conversions are designed to provide greater comparability between student performances across the breadth of University subjects.

The Table below shows the correlation between those and Ranks.

Reporting Scale	% equivalent	Designation	Criteria for Essay-Type Answers
20	85-100	Distinction	Exceptional work showing exemplary organisation, mastery of topic and sound critical judgment. Demonstrates flair, superior insight and innovative work.
19-19.9	80-84.9	Distinction	Excellent answer which reflects all of the following: evidence of extensive reading and a thorough understanding of relevant concepts, with original commentary and critique. Excellent use of data/examples.
17.0-18.9	70-79.9	Distinction	Very good answer which reflects most of the following: evidence of extensive reading and a thorough understanding of relevant concepts, with original commentary and critique. Very good use of data/examples.
13.0-16.9	60-69.9	High Merit	Good answer that displays most or all of the following: well structured, organised, coherently written and presented; logically argued; sound grasp of topic; evidence of adequate reading; good use of examples.
11-12.9	55-59.9	Low Merit	Reasonable answer that displays some, but not most, of the following: well structured, organised, coherently written and presented; logically argued; sound grasp of topic; evidence of adequate reading; good use of examples.
7-10.9	45-54.9	Pass	Pass answer, but flawed by one or more of the following: poor organisation or presentation; illogical argument; tenuous grasp of topic; insufficient reading; poor use of examples; irrelevancy.
4-6.9	32-44.9	Fail with Resit	Marginal fail: seriously flawed by poor organisation, misconceptions and limited understanding of topic, lack of reading, and/or irrelevancy.
<3.9	<32	Fail with no Resit	Fail lacking in substantive content: exhibits next to no grasp of topic and/or is largely irrelevant. No discernible structure or argument.

Please refer to the below link for further information on the University's policy on Classification, Grades, Marks and 20-point scale.

<https://www.st-andrews.ac.uk/media/teaching-and-learning/policies/grades-definition.pdf>

Earth Sciences staff aim to mark work within 3 weeks of submission, but there can be good reason why that is not possible. Examine the comments on your returned work carefully and reflect on how to improve future performance.

It is important to realise that, in accordance with normal educational practice, there is no fixed conversion between marks and grades; you may find different conversions (as appropriate to the task set) between modules that you take in different Schools, and any that you take with credit-transfer at other Institutions. Indeed the conversion seen above may for a particular exercise differ, in the light of class performance.

Further Guidance About Assessment

Following on from 1st-Year study, it becomes even more important in 2nd Year that you manage your time well and devote appropriate amounts of time to daily reading and the revision of lectures and labs. Your extra-curricular activities will most likely increase from last year thus time management is crucial for you to maintain the quality of work that will assure your entry into Honours. So, be disciplined and wise---manage your time well!

Coursework

Your lecturer will explain your 2nd-Year coursework and related assessment and assessment deadlines at the beginning of each module. Similar to 1st Year, coursework evaluation is based on lab practical tests, maps, field excursions, essays, and group projects. Likewise, you will be evaluated on your understanding of the principles taught in the course, your skill in applying these and in presenting your findings, and through your explanations on the thinking that you have undertaken.

Assessments should be submitted to the School Office with your matriculation number (not your name) and module number, unless your lecturer instructs otherwise. Even if some of your work must be turned in through the plagiarism detection software, make certain to also submit a copy to the Office. The penalties for late submission are the same as last year---see the PENALTIES FOR LATE SUBMISSION AND WORK OF INCORRECT LENGTH section of this Handbook to refresh your memory of those.

Note that all continuous assessment grades are technically provisional until endorsed at the School Exam Board meetings with the External Examiner in January and May, thus retain every piece of assessed coursework for possible scrutiny by the External Examiner.

Exams

The dates for 2018-19 are:

S1 Exam Diet: Mon 10-Fri 21 December 2018

S2 Exam Diet: Mon 13 – Fri 24 May 2019

Your 2nd-Year exams are 2 hours long and consist of answering short answer and essay questions; the exact format will be described in the exam-tutorial sessions. The provisional Examination Timetable will normally be published no later than Week 6 of Semester 1 and Week 7 of Semester 2. You will be advised via the Wednesday memo when the provisional timetable is available for checking. Please ensure you check the timetable carefully.

Past exams (essay questions only, not short answer questions) are available through MySaint (<https://mysaint.st-andrews.ac.uk>). As you learned last year, useful preparation for exams is to write practice answers against the clock, making certain to include relevant material learned from lectures, textbooks, journal articles, practical classes and field excursions. Informative, clear sketches are enormously useful and help you to better understand geological relationships and processes, as well as highlight those aspects in which your understanding is less clear. Hence, practice making sketches throughout the semester. Also make certain that for your essay answers you cite properly the source from which you obtained information. For example: "Hoffman (2009) has shown that pan-glacial states existed for many millions of years during the Neoproterozoic Period".

You are required to be present through the last day of the semester and freely available for the full duration of the December and May Examination Diets. Remember, poor time scheduling on your part is not acceptable as a valid excuse for missing an exam.

It is your responsibility to ensure that your handwritten answers provided in examination scripts are legible and can be read by the markers. If a script cannot be read by the marker then this could result in a delay in confirming your module grade. You may be charged for a transcription service and could be required to return to the School(s) concerned in order to transcribe the script. If you have already left St Andrews then you will have to bear the costs of any return travel to the University. More information is available at: <https://www.st-andrews.ac.uk/media/teaching-and-learning/policies/illegiblescripts.pdf>

More information on Examinations, timetables, rules and re-sits is available from the Student Handbook (<https://www.st-andrews.ac.uk/students/>).

Marking

Exams are anonymously marked such that all your personal details are completed along a strip that you seal before leaving the examination hall and that your short answer papers only have your matriculation number on the front. The strip will remain sealed whilst your script is being marked and the mark agreed and recorded by the internal marker(s). Only then is the strip opened and your personal details recorded. Recall that all coursework and exam scripts are subject to scrutiny by the External Examiner.

Post-exam

The University policy on exam feedback and access to exam scripts is found in the **Student Handbook** at <http://www.st-andrews.ac.uk/media/teaching-and-learning/policies/FeedbackAssessedWork.pdf>.

You will receive generic feedback during the tutorial on the exam performance of the class. To see and discuss your individual script, arrange to meet with the Sub-Honours Co-ordinator.

Penalties for Late Submission of Work and Work of Incorrect Length

As emphasized to you last year, the rule '*deadlines are deadlines*' applies to all your 2nd-Year work. Requests for extension will only be considered in the case of debilitating illness, surgery and close family bereavement, and such requests must be made **BEFORE** the deadline. Extra-curricular activities/responsibilities/duties, poor time management or computer failure are not considered to be valid excuses.

The penalty for unapproved late submission of work is subtraction of 5% of the maximum available mark per day or part thereof, for up to 1 week, beyond which the penalty is 100%.

The penalty for over-length essays is subtraction of 5% of the maximum available mark for work that is over-length to any extent, then a further 5% of the maximum mark per additional 5% over. On the front cover of an essay you must state the word count. The number of words included in the count includes the text, the content of tables but does not include the reference list, the abstract, captions to figures and tables and text in maps. Disputes about word count should be taken up with the module coordinator.

No item of SEES work may normally be submitted after the first day of each Revision week.

Threshold Performance

You must attain an average of at least 4.0 (on the 20-point scale) for coursework otherwise your registration in the module will be withdrawn and you will not be eligible to sit the end-of-module examination. If your exam score is less than 4.0 (on the 20-point scale you cannot complete the module, regardless of the coursework mark and aggregate score of coursework and exam. Further, you must achieve at least a 4.0 scale point in order to retain the right to one re-assessment. If you fail a module, but score more than 4.0 scale points you can re-sit the examination.

Re-sit examinations are worth 80% of the final module mark, and 20% is from the continuous assessed work.

Independent Learning Week

The University, based on student feedback and staff consultation, has introduced an Independent Learning Week in Semester 1 to provide a space in the semester for consolidation, catch-up and revision. For AY 2018-19, ILW will be in Week 6. ILW is **not** a holiday and the School of Earth and Environmental Sciences will be providing study guides for ILW that will help students complete work for assessments that are due later in the semester.

Honours Classification

The University applies a common formula for the calculation of the award of Honours classifications. Degrees are classified using a credit-weighted calculation of grades achieved for Honours-level modules (3000 level and above) taken during an approved Honours programme. This ensures consistency, particularly if you are taking a joint degree. Full details of the University's Honours Classification algorithm can be found at:

<https://www.st-andrews.ac.uk/staff/teaching/examinations/honours/>

Other Regulations and Support

University Student Handbook

The University Student Handbook describes the regulations governing your degree and can be found at: <http://www.st-andrews.ac.uk/studenthandbook/>

You should make sure that you are familiar with this Handbook, which is also an essential resource for you as it contains the most up to date policies and information on a range of support services including:

- Semester dates
- Examination dates
- The 20-point common reporting scale
- University statements on classification, grades, marks and the 20-point scale
- Honours classification
- Honours entry
- Good academic practice
- Special circumstances and the S-coding policy
- Academic appeals, complaints and disciplinary issues
- Student support and advice
- Absence reporting for students
- The Dean's List annual awards for academic excellence
- The undergraduate research internship programme (URIP)
- Recording devices in lectures
- Academic Flexibility for Students with Recognised Sporting Talent
- Degree regulations
- Leave of Absence
- Withdrawal from studies
- The Academic Alert scheme for missing deadlines or compulsory elements of a course
- Penalties for late/over-length work
- Feedback on assessment
- Printing and binding services
- Student fees
- Disability support
- Health and safety information

Academic Alert

Academic Alerts are a way of helping students who are having trouble coping with their studies, such as missing deadlines for handing in work, or missing compulsory tutorials. The aim of the Alert system is to help students by flagging up problems before they seriously affect students' grades. Academic Alerts will be issued by email from a member of staff within the School and will tell students what is wrong and what they are required to do (e.g. attend classes in future). The Alerts will also tell students what support the University can offer. If students do not take the action required they will get another Alert, and eventually will automatically get a grade of zero and will fail that module. The system is designed to help and support students in order to remedy any problems or issues before these lead to failing a module. Alerts will never appear on a student's permanent transcript. For more information on Academic Alerts and details on how the categories work, see

<https://www.st-andrews.ac.uk/media/teaching-and-learning/policies/AcademicAlerts.pdf>
Guidance for students is available at <http://www.st-andrews.ac.uk/media/teaching-and-learning/policies/AlertsStudentGuide.pdf>

For the School, compulsory module elements are **lectures, lab practicals, field work, tutorials, lab practical tests, and end of module exams**. If you are unable to attend for unexpected reasons, you need to complete an online Self Certificate of Absence (see the University Student Handbook for details). If you know of a justifiable reason for being absent, you must obtain approval **ahead of time** from the Module Coordinator.

Lecture attendance is expected for all Earth Science modules, which means absence on rare occasions only. We monitor attendance and an Academic Alert will be issued if your attendance is poor. You must inform the lecturers ahead of time if you are going to miss a lecture and complete an on-line Self Certificate of Absence. Students who fail to sit end-of-module examinations without good cause will receive the highest level of Academic Alert and a mark of OX. Absence due to illness or emergency should be reported as soon as possible (see the University Student Handbook for the procedures). You must also inform the Module Coordinator and the School Office.

Advising

At the beginning of each session, you must see, in person, your Adviser of Studies who will approve choices of modules and give guidance on matters relating to academic progress. Ordinarily, you are allowed to change modules up until 13:00 Monday of Week 2 in each semester. After that, your Adviser of Studies or Programme Coordinator must place a special request on your behalf to the appropriate Pro Dean. *No matter what level of module you are studying, you must contact your Adviser of Studies to obtain approval for any change.*

You cannot enroll yourself into a new module or start attending the classes for a new module, at any level, without being **Re-Advised**. Advising is one of the primary means by which your academic record is maintained and unless you ensure that this is kept up-to-date through your Adviser, you may find you will not receive the credit for the modules you have taken.

Fieldwork and safety issues

One of the biggest appeals of the Earth Sciences is the amount of time spent out of doors gaining first-hand experience, often in regions of spectacular scenery. The area surrounding St Andrews is an excellent natural laboratory for geology. In fact, in 1902 Sir Archibald Geikie, the then Director of the Geological Survey, said *'If I were asked to select a region in the British Isles where geology could best be taught by constant appeals to evidence in the field, I would with little hesitation recommend the East of Fife as peculiarly adapted for such a purpose'*.

By its very nature however, fieldwork exposes you to the vagaries of weather and varying terrains. Consequently you need to equip yourself with good field clothing, strong walking boots and carry sufficient food and water. Fieldwork involves scrambling around, inevitably resulting in minor cuts and scrapes. You are strongly advised to consult your doctor or the St Andrews Health Centre for advice (e.g. are injections up to date?) and with your parents and/or the Students Association Services about personal accident and liability insurance.

Health-and-Safety Code

The School Field Work Safety code is posted on the Moodle page of the module. You must read it carefully and acknowledge that you have understood it by answering the "mandatory question" available in Moodle. We will make every effort to maintain safety in both the field and in the laboratories and you will be given specific instructions prior to any fieldwork. But, it is impossible to warn you of every element of risk. Exercising good common sense is the best precaution against accidents; pay close attention to what the lecturer is telling you concerning risks, think before you act and, if you feel uncomfortable or frightened trying to do something, **then DON'T DO IT!**

In compliance with Safety Regulations, the School will provide you with a hard hat, goggles and a high visibility vest. You will not be permitted to attend field excursions without them. You will also receive a hand lens and a grain size card for examining rocks, minerals and fossils in the field and in the labs. These are your items, they are not to be returned for a deposit, and if you lose them, you must replace them.

First Aid boxes are in the Bute Lab, the Main office and IT, Forbes and Lapworth labs in the Irvine Building. A number of staff are trained First Aiders, including Stuart Allison (01334 463922).

Fire Alarms, Other Alerts and Smoking Policy

If you hear a fire alarm, or are alerted to any other sort of emergency or danger, get out of whichever building you are in quickly and quietly and follow the directions of Safety Officers to the designated meeting area and await their further instructions. If you find a fire, raise the alarm but do not attempt to tackle the blaze. If you are using the Irvine IT computing lab out-of-hours and a fire occurs, alert other users to get out of the building and phone the emergency services on 9-999 (a telephone is on top of the bookcase against the north wall, i.e., the toilet side). You must not re-enter the building until a University official gives permission.

Academic Appeals and Complaints

The Undergraduate Student Handbook contains information about how to appeal and challenge any marks awarded for assessed work or your module grades, or to make a complaint about your academic experience. The University is committed to ensuring as high a quality of student experience as possible to any student studying in St Andrews. Occasionally things may go wrong and if you are experiencing a difficulty, or are dissatisfied with your academic experience, raise your concerns as soon as possible with the appropriate people. Refer to the University Student Handbook for guidelines and points of contact.

Further Guidance and Support

As a University of St Andrews student you are on a journey of learning. The person you arrived as will be different from the one who leaves. This change will reflect the knowledge and skills you will gain, and the experiences you will have throughout your time here. It is unlikely that your journey will always be smooth, but dealing with the unexpected challenges you encounter along the way will help you develop the skills you need to make you a better scholar and better able to cope with life beyond university.

Key areas to focus on during your St Andrews journey include:

1. *Developing independence.* This means that you actively seek out information, take charge of finding the right balance between your study and personal life and take responsibility for your behaviour.
2. *Facing challenges.* It's perfectly normal to find things challenging in your academic studies and general student life. Some challenges may lead to disappointment or even failure. The important thing to remember is that you will be strengthened by these challenges, developing important life-skills such as problem-solving and resilience.
3. *Being involved.* As a student at St Andrews you are part of several communities, and you have the opportunity to become involved with them. You are part of the community within your academic school, part of the broader University community and part of the wider community of the St Andrews town. You are encouraged to make the most of the academic, social, societies and sports opportunities on offer as a way to positively build knowledge, skills, support networks, and physical and mental wellbeing.

For advice and support on any issue, including academic, financial, international, personal or health matters, or if you are unsure of who to go to for help, please contact the Advice and Support Centre, 79 North Street, 01334 462020, theasc@st-andrews.ac.uk, <https://www.st-andrews.ac.uk/ask-a-question/>.

Good Academic Practice

All students should read the University's policy on good academic practice:

<http://www.st-andrews.ac.uk/students/rules/academicpractice>

It offers guidance to avoid potential problems related to academic work such as: presentation of material as one's own when it is not and academically inappropriate behaviour. Any work that is submitted for feedback and evaluation is liable for consideration under the University's Good Academic Practice policy, irrespective of whether it carries credit towards your degree. All work submitted by students is expected to represent good academic practice. Full details of the policy can be found in the University Student Handbook.

Plagiarism detection software is used by the University to detect whether any part of a piece of written work is copied from the internet, a journal article, a book, or a previous student's piece of work. It has a very powerful search engine. Students who are unsure about the correct presentation of academic material should consult with the Sub-Honours Coordinator.

You should also refer to the Guide for Students:

<http://www.st-andrews.ac.uk/media/teaching-and-learning/policies/gap.pdf>

Orientation/Pre-sessional Week

Orientation/Pre-sessional Week is an integral part of the University semester, even though no classes are scheduled during that time. It offers you an opportunity to prepare for classes by purchasing and beginning work on course material and attending induction meetings.

Scholarships, Bursaries & Awards

The University has a number of bursaries, scholarships, and awards for academic achievement each year (see the University Student Handbook for descriptions and details). The School also presents Irving Prizes for Excellence in Field Work every year. These arise from a bequest from former students John and Aileen Irving. There is a medal for the top Earth Science student in First Year, and the Davidson Medal is awarded to the top Earth Science student in Second Year. School prizes are included in your transcripts.

Student Responsibilities

Students are responsible for ensuring that their personal details are kept up to date and should make any changes online via the web at: <http://www.st-andrews.ac.uk/students/>

Earth Sciences follow the University's *Code of Practice for Quality in Teaching and Learning* that every student should:

- recognise that it is his/her responsibility to familiarise him/herself with the aims and objectives and scope of a class before enrolment, to ensure that the class suits his/her interests and degree plans;
- regard enrolment in a class as a contractual agreement; this involves attendance at **all** activities scheduled for the class;
- arrive punctually for all activities scheduled for the class;

- inform lecturers where absence or late arrival is unavoidable;
- complete all preparatory work required of them;
- meet all deadlines for submission of assigned work, unless agreed with the lecturer;
- consult his/her lecturer if in doubt about the appropriateness of, or reason for, a grade on an assigned piece of work;
- treat all school staff with courtesy.
- **switch off mobile telephones during lectures and laboratory classes**

The School follows the Quality Assurance Agency for Higher Education guideline that one credit is regarded as reflecting the learning outcomes achieved through 10 hours of 'student effort', which means lectures, practical classes, seminar attendance, field work, report writing, personal study and preparation for examination. That translates into an expectation that each student works at least a 40-hour week, with the time distributed among the various modules studied.

You should make yourself aware of the **Senate Regulations and the key Codes of Practice** and Rules that govern your studies and behaviour in St Andrews. These are all available on the University web page under the Sections on Academic Matters and Policy & Guidance.

The University regards both bullying and harassment as unacceptable. For more information and points of contact, see the University Student Handbook.

Staff appreciate that some students need to take paid employment during term-time. Having employment is not, however, a valid reason for missing classes, not attending field courses, for poor performance or late submission of assignments. Employment does reduce the time and energy available for your academic work, so keep the hours worked to a minimum.

Your University e-mail account is the official means of communication for the University and you are therefore reminded that you should read your e-mails at least every 48 hours (particularly during the academic year). You can arrange to have your University e-mail account automatically forwarded to your personal external account; if so, you must check regularly to make sure the forwarding is working.

Equality and diversity

The School of Earth and Environmental Sciences was awarded an Athena SWAN Bronze department award in April 2016. The Athena SWAN award recognises our commitment to improving equality and diversity in science, technology, engineering, maths and medicine (STEMM) employment in academia. We have identified particular challenges for future improvements and we are implementing an action plan to address these. All the school E+D resources (our action plan, minutes of equality and diversity meetings, additional information) are published on the school Equality and Diversity moodle page, which is accessible to all students. Details of membership of the School's E+D committee is also included on this page (including UG, PG, postdoc, technical, admin and lecturing representatives). Please speak to any member of the committee if you have any suggestions or wish to raise any concerns within the remit of the committee.

Students With Disabilities

In accordance with the University's equal opportunities policy, the Disability Discrimination Act 1995, and the Special Educational Needs & Disabilities Act (SENDA) of 2001, every effort will be made to work with students to overcome any academic problems that arise from disability. If you have advised the University of your specific disabilities, your needs will be automatically passed to module coordinators via the Disability Information Flow system.

In Case Of Difficulty

Earth Sciences staff operate an 'open door' policy to students - you are welcome to come and talk to us at anytime. If we cannot see you then, we will arrange a time. General problems, queries and suggestions about the ES2000 modules should be taken to the Sub-Honours Adviser.

For advice and support on any issue, including academic, financial, international, personal or health matters, or if you are unsure of who to go to for help, please contact the Advice and Support Centre, North Street, 01334 462020, theasc@st-and.ac.uk.

In some instances lecturers can spot when you are experiencing difficulty, but not all problems can be detected. For your own benefit you should inform the lecturer if you have particular difficulties with the work. If you have a complaint about some aspect of a module, talk to the lecturer or see the Module Co-ordinator. You can also raise the matter with your Class Rep on the Student-Staff Council.

Student Geological Society

This Society is organised by students and its function is to promote extra-curricular activities and social events, as well as provide support in your studies. GeolSoc organises field trips, trips to career events around the UK and to attend seminars in other Universities. By joining, you will be more involved in the School and will meet new friends who have similar interests and can pass on their experiences of the degree course and the modules. You will also be able to attend lectures by invited speakers, be part of an annual dinner-dance and sporting matches. Join the Society early and get involved.

Maths Support Centre

One-to-one help with any mathematics-based problem is provided by the University's Mathematics Support Centre, which is run by experienced maths teachers. See:

<http://www.st-andrews.ac.uk/students/academic/advice/studyskillsandadvice/mathsandstatisticsupport/>

The Centre is part of CAPOD (Centre for Academic, Professional, and Organisational Development), which supports skills training; see: <http://www.st-andrews.ac.uk/capod/>.

Getting Your Views

As per 1st-Year, you will be asked to complete anonymously questionnaires giving feedback on your opinions of the modules. This information is used to assess your view of staff performance and their modules, and to consider any modifications that might enhance teaching and learning. The data on the questionnaires form the basis of reports, compiled by the *Earth Science Quality Audit Officer*, used by the Earth Science Teaching Council to discuss where changes are required. This enables us to keep our standards of teaching high and to respond to issues jeopardising that. We rely on your help to do so, whether it is through the questionnaire, informal conversation with members of staff, or the Staff-Student Council.

The Staff-Student Council meets once per semester to discuss issues that could range from problems about modules or accommodation, to seeking student views on a proposal. The aims are to keep students informed about academic matters, to obtain their views on proposed changes, to respond quickly to their concerns, and to involve them in keeping standards high. The Student President is responsible for collecting the views of the students through the Year Representative and for organising the Staff-Student Consultative Council (SSCC) meetings, as well as which members of academic staff should be included in the SSCC. The minutes of all meetings are reviewed and discussed at Earth & Environmental Sciences Teaching Council meetings and are reviewed by the External Examiner in January and May during the Examination meetings.