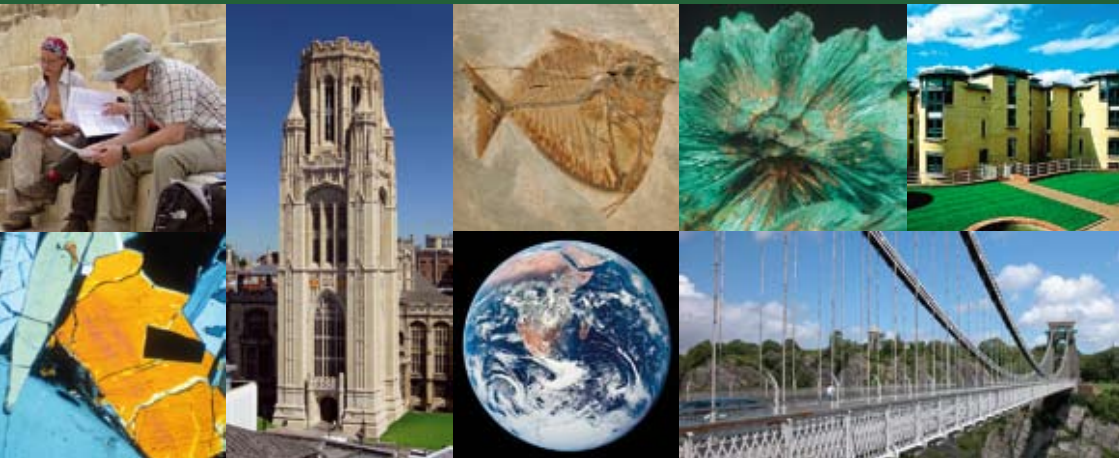


GEOLOGY and ENVIRONMENTAL GEOSCIENCE



at the Department of Earth Sciences
University of Bristol

Programmes

At Bristol you have a choice of twelve Honours Degree programmes:

- BSc Honours in Geology (3-years).....UCAS code F600
- BSc Honours in Environmental Geoscience (3 years).....UCAS code F640
- BSc Honours in Geology & Biology (3 years).....UCAS code FC61
- BSc Honours in Archaeological Sciences (3 years).....UCAS code V401
- MSci Honours in Archaeological Sciences (4 years).....UCAS code V402
- MSci Honours in Geology (4 years).....UCAS code F603
- MSci Honours in Environmental Geoscience (4 years).....UCAS code F641
- MSci Honours in Palaeontology & Evolution (4 years).....UCAS code CF16
- MSci Honours in Geology with Study in Continental Europe (4 years).....UCAS code F604
- MSci in Environmental Geoscience with Study in Continental Europe (4 years).....UCAS code F642
- MSci Honours in Geology with Study in North America (4 years).....UCAS code F607
- MSci in Environmental Geoscience with Study in North America (4 years).....UCAS code F643



The Geological Society of London is the UK national society for geoscience. It exists to promote the geosciences and the professional interests of UK geoscientists, along with professional excellence and ethical standards in the Earth Sciences for the public good.

All Earth Science programmes at the University of Bristol are accredited by the Society.

Geology and Environmental Geoscience

Are you fascinated by volcanoes, astonished by dinosaurs, or concerned about the future of the Earth? The Earth Sciences include these topics and more – in fact everything to do with the way the earth, oceans and atmosphere work, and about their history since the origin of the Earth.

We teach programmes in geology, environmental earth sciences, palaeontology and Archaeological Sciences. The programmes are stimulating, up-to-the minute, broad-based, and an ideal training for a wide array of jobs in the industrial, economic, media, education and research sectors.

Geology is the study of the Earth, its history, materials and processes. It ranges from the search for underground sources of water, oil and gas to investigation of the beginnings of life on the Earth and the origin of the planet 4,600 million years ago.

There is also a growing awareness and interest in many environmental questions, ranging from global climatic change to disposal of toxic waste. **Environmental Geoscience** is concerned with many of these issues, including the development of a sustainable economy for a large population.

Palaeontology is the study of the life of the past, and the degree programmes cover all the basic earth sciences and biology you need, as well as advanced courses on lab techniques, dinosaurs, human evolution and research. The importance of **Archaeological Sciences** has been highlighted by astonishing research findings, and endless TV programmes. Taught with the archaeologists in Bristol, you learn how to excavate sites, how to use geophysics and geochemistry in interpreting sites and artefacts, and how ancient peoples used natural resources.





The Department of Earth Sciences

The whole world is the geoscientist's laboratory, and fieldwork plays an important role. Most geoscientists have opportunities of travelling to interesting, exciting and sometimes remote areas of the globe.

Earth Science has been taught in Bristol for over 100 years, and the Department has grown substantially in the past 15 years, with the addition of extensive modern laboratories and teaching areas. The subject has expanded in Bristol to include great research and teaching strength in Earth system science, astrobiology, and geophysics in the last five years.

The reputation of the Department has grown. It is ranked number 4 in the *Times Good University Guide* for 2007. Job prospects for graduates are buoyant. Overseas students and researchers are attracted by our very high research ratings, and these bring money for ambitious investment. In the 2001 Research Assessment Exercise, the Department was awarded the top Grade 5* indicating the highest international standard, one of only three Earth Science departments in the country to receive this award.

We enrol about 60 Single Honours students each year and geologists and environmental geoscientists share a common first year, so choices are kept open. We have 30 members of teaching staff, about 30 postdoctoral

research staff, over 50 postgraduate research students and 30 MSc students. These young trainee researchers, from all over the world, give the Department a real buzz of activity as they investigate the limits of knowledge in volcanology, environmental geosciences, deep earth composition, isotope geochemistry and palaeontology.

The Higher Education Funding Council for England has highlighted the following teaching strengths in the Department:

- well-qualified and enthusiastic staff
- excellent rapport between staff and students
- a wide range of innovative and challenging advanced modules
- advanced information technology, enhancing the learning experience
- an effective approach to the development of transferable skills
- well-equipped and well-organised laboratories, promoting an excellent learning environment.

The high reputation of the University and the attraction of the city of Bristol are important assets enjoyed by our students. We invite you to consider studying Earth Sciences at Bristol and joining us in a pleasant and friendly environment.

MSci or BSc?

We were the first earth sciences department in the UK to introduce the new 4-year MSci (Master in Science) programmes, from 1992, and our MSci graduates have enjoyed tremendous success in stepping straight into professional careers. The range of MSci options was expanded in 2004 to include all degree pathways, and we have made the MSci the norm for most students admitted to the Department.

The MSci is currently offered in Geology, Environmental Geoscience, Archaeological Science, and Palaeontology and Evolution. These degrees are of value for students who wish to move to a PhD (an MSci is now pretty much expected for entry to PhD programmes), but also for other science-based jobs. In a world where there are thousands of graduates with Bachelor's degrees, employers are attracted by someone with an extra qualification. Your project is likely to be a valuable topic of conversation at job interviews, providing you with the opportunity to demonstrate your planning, organizational and other transferrable skills. *"Oh yes, I organised the entire expedition to Madagascar by myself. I was very glad that I had kept up my French and first-aid training after our cook sat on a scorpion...."*

The additional year is very much more research-oriented than any of years 1-3 of the BSc, the focus being on independent work. The research project makes up half of the work, and it is allocated half of the credit points. It occupies all of the time in teaching blocks 3 and 4, which run from late January to early June. You will have a strong involvement in developing the topic, and it can be as ambitious as you like.

Topics students have worked on in recent years for their MSci projects include:

- Sexual dimorphism in *Allosaurus* from Colorado
- Experiments in sediment gravity flows
- Eruption mechanics of the Montserrat volcano
- Modelling carbon fluxes in the atmosphere and ocean
- Botanical and palaeobotanical approaches to climate change in Australia
- Lithium isotopes and the nature of the deep mantle
- Diamond formation in deep kimberlite pipes in South Africa.

Many of these MSci projects involve overseas fieldwork in the summer before Level 4, and students have worked on all continents so far, except Antarctica (and that may change soon enough!). In all cases, we organise contacts and help with logistics. In many cases, students obtain sponsorships with major companies or other institutions, to help cover the costs. We also encourage and help students to bid for grant support from various societies and charitable foundations.

The aim of the fourth-year MSci project is to produce a piece of publishable work. This means it must be original, new, correctly carried out, and succinctly reported. This is a tough challenge, but it's a real test in the real world.

Student projects are closely supervised by staff and trained researchers in the various research groups in the Department. There is a programme to teach you how to write technical reports, how to analyse data, and how to prepare your work for publication. Students have access to all the equipment they need, and there are training courses in all the specialized laboratory techniques that may be required. But in the end, we can only open the door and provide the materials... success in the project is down to you!



MSci or BSc in Geology

These programmes provides a broad and comprehensive training in geology, preparing you for employment in a wide range of geological or other scientific fields, as well as study for a higher degree. Small groups meet regularly with their tutors throughout the course.

First year

The first year is a broad introduction to the Earth Sciences: geological time, geochronology, structure of the Earth and global tectonics, mineralogy, igneous geology, metamorphism, economic geology and resources, sedimentology, palaeontology, Earth history and geological maps. You take the first year of the Environmental Geoscience programme, and you also study another science subject of your choice as a subsidiary unit. Fieldwork includes day-trips during term-time and a week during the Easter vacation.

Second year

This continues study of the central aspects of geology to a more advanced level, as well as introducing a number of new topics such as geophysics and geochemistry. You will extend your knowledge of how to use the departmental computer network to the full, and you will get practice in developing your written and spoken communication skills. Fieldwork includes a class during the Easter vacation, and a week learning the techniques of geological field mapping during the summer vacation preceding the second year.

Third year

The third year comprises a selection of units covering a wide range of topics. Currently these include: evolution of the terrestrial planets, the continental crust and the biosphere, palaeobiology, engineering geology, applied geophysics, physical volcanology, metamorphic petrology and petroleum sedimentology. Some of these are options while others form a mandatory core to the curriculum. For five weeks during the summer vacation preceding the third year you carry out an independent geological field project currently abroad, and there is a field class at Easter, also abroad.

Fourth year

The fourth year is half taught and half independent project. The year begins with a bang, with a field trip to Santorini and the Greek islands to study volcanoes, active earthquakes and metamorphism first hand. You then do a mix of compulsory units (scientific communication, research methods, current controversies) and choose advanced units related to your enthusiasms. The project continues through this time, and then occupies all your time for the second half of the programme. Get your teeth into volcanoes, deep-earth geochemistry, fluid flows, fossil preservation....

An academic career...



I had no plan. I only became aware of Geology while chaotically deciding on which A'levels to take. The subject was completely new to me, and I was excited by the new perspective on the world and the landscape that it gave me. I didn't even have to think about

which subject I should take at university, let alone whether I should go to university! My 'career' has always been led in this way, by whatever excites me and so I find it easy to motivate myself, even while undertaking the sometimes tedious tasks that are inevitably associated with anything that might be considered 'work'. So, after a degree in Geology, I took an MSc and PhD in palaeontology, studying ancient oceanic events and the evolutionary origins of the vertebrates – our deep ancestors. I moved to Bristol in 2002 and I'm staying until they sack me!

Lecturers typically spend relatively few hours a week actually lecturing, so what are they doing for the rest of the time? Beards are omnipresent – so perhaps it's facial topiary? Obviously, preparing for lectures and tutorials, and 'administration', takes up a lot of additional time, but most of the remaining

hours of the day, and especially those beyond what might normally be considered a working day, are spent doing research which, along with teaching, is the really fun bit of the job.

Lecturers have great freedom in their choice of research, so long as it is worth doing, which is judged in many ways, not least through finding someone to pay for it! Again, I've always directed my research by what excites me. At the moment, this is the relationship between embryology and evolution, which is allowing me to learn about the world of molecular biology.

Some of my research is based in laboratories or on computer terminals. Sometimes I travel across Europe to use a particle accelerator, and at other times I may be collecting embryos from rivers, or rock from remote parts of China, Australia, and the USA. The job is incredibly varied and so there is no time to be bored. Research results also have to be reported, as journal reports and at conferences in exotic locations like Sydney, San Diego, Beijing and even Birmingham.

No wonder I've never found time to cultivate a beard!

Dr Phil Donoghue
Lecturer in Palaeontology.



"Bristol is a great place to study geology from both an academic and a social perspective. The department has a very strong reputation for both its standards of research and teaching and it's a very friendly place to spend four years studying. On any earth sciences course that involves large amounts of fieldwork, you can't help but get to know everybody on your course as you end up working, living and socialising with them, whether you like it or not! The MSci programme gives you the opportunity to carry out original research in an area of earth science that is of particular interest. I did an experimental project into the settling dynamics of sediment gravity flows, however there are a wide variety of research groups at Bristol and so it is possible to develop a fourth year project that is directly related to your particular interests. Since graduating I have continued to study in the department and am currently doing a PhD here."

Esther Sumner
From New Mills School, Derbyshire. A levels in Maths, Further Maths, Physics and Geography. Graduated with a 1st Class MSci in Geology, 2005.



MSci or BSc in Environmental Geoscience

This programme is strongly science-based, emphasising the interactions between the geosphere, biosphere, hydrosphere and atmosphere in developing and controlling the Earth's environment. This dynamic Earth system is studied through the interactions between geology, biology, chemistry and physics, which together define conditions on the Earth and how these may be influenced by human activities. The basic science and skills required for second and third year units are taught in the first year, in an environmental context, and this science base is further reinforced in tutorials.

First year

The first year is an introduction to key environmental topics: global biogeochemical processes, environmental systems, geological hazards and environmental impact, conservation, waste and pollution, together with some basic science. You take the first year of the Geology programme, and you also study another science subject of your choice as a subsidiary unit. There is an overseas field class during the Easter vacation.

Second year

This includes inorganic geochemistry, sedimentology, environmental geochemistry, hydrogeology, geobiology, atmospheric processes, applied geophysics, soil geoscience

and analytical methods in environmental geoscience. You will also extend your use of the departmental computer network to the full, and have practice in developing your written and spoken communication skills. There is a field class, abroad, in the Easter vacation.



Third year

Third year units currently include: contaminant transport, oceanography, engineering geology, sustainable development, applied geophysics, nuclear energy, petroleum sedimentology, environmental law and toxicology, and conservation biology. Some of these are options while others form a mandatory core to the curriculum, and there is a field class during the Easter vacation. You also carry out a literature based research project.

Fourth year

The fourth year is half taught and half independent project. The year includes a field trip to Tunisia to study water supply and environmental issues in a part-way developed, but arid country. You then do a mix of compulsory units (scientific communication, research methods, current controversies) and choose advanced units related to your enthusiasms. The project continues through this time, and then occupies all your time for the second half of the programme. Get your teeth into carbon dioxide sequestration, methane hydrates, waste disposal and water flow, uranium in the environment, global climate modelling...

Some recent third year environmental geoscience literature review projects have included:

- Fe fertilization and the sequestration of atmospheric CO₂ - in the past and in the future
- The oceanic role in millennial climate change as recorded in polar ice cores
- Assessing the hazards Mount Ruapehu poses to the people of New Zealand
- The origin of swings in atmospheric carbon dioxide content on glacial-interglacial timescale
- The development of wind power and its integration into UK energy policies
- The chemistry of depleted uranium corrosion products in soil

Some recent fourth year environmental geoscience research projects have included:

- Anaerobic methane oxidation in marine sediments
- Using high-resolution data from lead isotopes to show that continental weathering rates vary on a glacial to interglacial timescale
- Hydrological and geochemical response of freshwater lens to recharge in tropical carbonate islands
- Neodymium isotopes in the ocean: a proxy for ocean circulation and weathering input
- Methane oxidation by low affinity methanotrophic bacteria

"A short while after graduating, I got work with subcontractors employed by Thames Water to validate the water supply network in Central London (a posh way of saying we checked the position and operation of pipes and valves while also checking for leakage, of which there was a great deal!)"

After 18 months or so and a spell in Thames Water Customer Services, I left to join the Environment Agency in Feb 2004, training first as an Environment Officer in the National Induction Scheme before becoming fully warranted as an Enforcement Officer. In this role I support the environment officers in their dual roles of attending and investigating environmental incidents and regulating the waste and water industries.

My job includes the co-ordination and production of investigation case files for consideration by the Environment Agency's in-house legal department. It is interesting and challenging work, often frustrating when things don't go as planned but very rewarding when we get positive results. It is also great to be part of a forward-looking organisation whose role and goals I can identify very closely with. Certainly Bristol University gave me the basis for an interesting and rewarding career."

Steven Cave, mature student with Access to Science qualification. Graduated with a 2:1 BSc (Hons) in Environmental Geoscience



A day in the life...

What's it like being a student at Bristol? We can give the broad outlines, the mechanics of how it works. We also show some student views here, and on nearby pages. You can read more also in the on-line prospectus at <http://www.gly.bris.ac.uk/www/admissions/ugstudy/index.html>

The teaching week

On a typical day in first year you will have two or three lectures in the morning and a practical in the afternoon. Your first lecture might be in Environmental geoscience, then you might have to rush off to the Chemistry, Biology or Maths department for a lecture there, and then back for a Geology lecture. In the afternoon, there might be a 3-hour practical, where you look at some volcanic rocks, do some calculations about plate tectonic movements, or a radiometric dating curve, or learn how to use geological maps. Or, if it's an Environmental Geoscience practical, you might run some water samples you collected in the field through various tests to detect pollution levels; or you might prepare or present talks or posters on a debate topic like sustainability or global warming.

In the first year, you follow three courses, Geology and Environmental Geoscience if you are a single honours student. The third course may be in Chemistry or Maths, or any other science or related subject. If you are doing our joint honours programmes in either Palaeontology or Archaeological Sciences, your programme is entirely made up of our Geology course and units from the twin department.

Everyone has the same number of contact

hours each week in term time: nine hours of lectures (three lectures per subject) and nine hours of practicals (one 3-hour practical per subject). In addition, you will have roughly one tutorial each week, mostly in this department, but also in your subsidiary subject.

...and outside teaching time?

The terms run for ten weeks, and there are a total of 24 weeks of teaching time (most of the third term is taken up with – you've guessed it – exams). What about the vacations? You are expected to use non-contact time in term time, and the vacations, to do private studying. You'll be set essays and other tasks by your tutor and lecturers. But you also have to do your own study, reading recommended books, searching out data, backing up the stuff we teach you.

In the Easter and Summer vacations there is usually a field trip – a week each time in the first year, and a little longer in years 2-4. Field trips go all over Europe. At the moment, the Easter trip for Level 1 students is to either Arran (geologists) or Naples (environmental geoscientists). Later field trips go to Spain, Greece, France, England, Scotland, and (outside Europe), Tunisia for the fourth-year environmental geoscientists.

What do we teach you?

Most of the taught units are concerned with core earth sciences topics. They are graded, so you start at base level, and work up, year by year, to higher levels of understanding. The programmes are tailored to current themes, and we are constantly scrutinising and revising our courses. New topics in

the 2007/8 session include sustainable development and nuclear energy. These topics reflect changes in the sciences, the arrival of new staff, and suggestions from students.

You will also be taught a range of transferable skills such as written and verbal communication, group and project work, numeracy, computer literacy and analytical skills. In your first year you are introduced to the departmental computing facilities, to which you will have continuous access from the beginning of your time in the Department. In later years you are given practical advice about careers, writing of *curricula vitae* and how to make applications for jobs or research posts. Innovative learning techniques are used throughout, including teamwork, website design, discussion and debate, and poster and oral presentations. Such skills are essential for any graduate job, whether in science or in industry and commerce. Our students start their working life already running – they are confident about giving talks, writing web sites, and analysing data, all the skills needed in management and business.

The teaching is hands-on. Notice that you have nine hours of lectures and nine hours of practicals each week. The best way to learn is to do. So, we introduce new concepts and

techniques in the lectures, and then you practice them in the practicals. You learn to use equipment, to read maps, to make simple calculations, find the best statistical tests for particular data, and to solve problems of all kinds. Field work is also critical, and we describe this elsewhere.

Teaching and pastoral care

The mainstay of the teaching is lectures, practicals and field classes, supplemented by tutorials and 'office hours' when staff make themselves available to help you with any coursework problems that you may have.

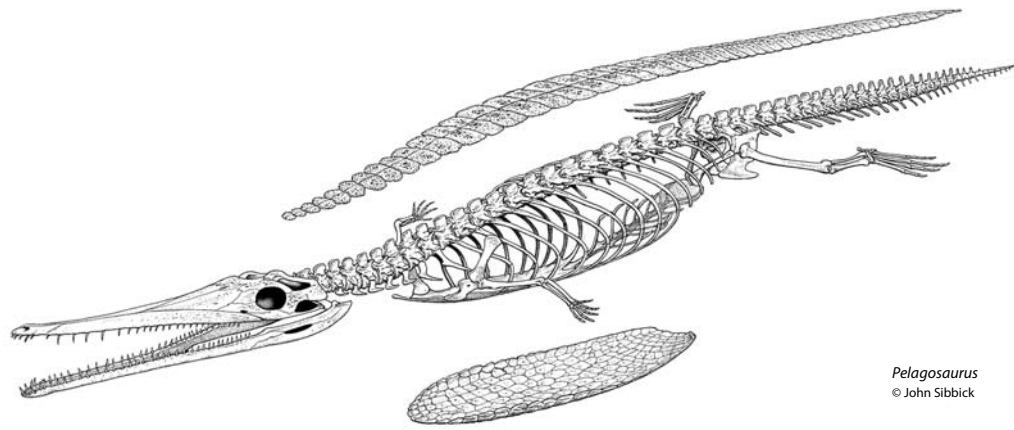
In addition, the Department operates an open-door policy so staff are available at any time for advice on academic and non-academic matters.

You will be assigned a member of staff as a personal tutor, who will follow your progress throughout your time with us and give you advice and help with any personal problems should the need arise. The Department also has a Senior Tutor who is available to help with personal problems. In addition, if you live in a Hall of Residence or a student house in your first year, as most students do, you will come under the care of wardens, hall staff and senior students.

During the third year of my degree I studied abroad at the University of Oregon in the USA. The university system is quite different over there, and I enjoyed the freedom of being able to choose all my units as it allowed me to try new things that aren't offered in our department in Bristol, and focus my studies on areas I was interested in, particularly climate change. Eugene is a lovely town- there are more trees than people so it's particularly pretty in autumn- it's quite small (140 000 people), with lovely buildings and a very relaxed atmosphere. It's also very forward thinking in relation to environmental matters and there were some great opportunities to get involved as a student.

Throughout the year I had a job with the Climate Leadership Initiative, a research group based on campus, where I assisted in the running of a public outreach programme related to education about climate change. Oregon is a beautiful state, with the Cascade volcanoes and a rugged coastline amongst its finest features, and the best thing is they're all about an hour away from Eugene! I took every chance to travel and managed to visit Vancouver, Seattle, San Francisco, LA, and the Canyons of Utah whilst I was out there!! I have so many fond memories from my year in the States, not only did I do some great classes and improve myself academically, I became much more confident in meeting new people, travelling on my own, and exploring every opportunity! I'd recommend the experience to everyone!

Jennifer Hodbod, Year 2, M.Sci Environmental Geoscience, with study abroad in North America. From Bury, Lancashire.
A levels in Biology, Chemistry, Physics and Geography.



Pelagosaurus
© John Sibbick

MSci in Palaeontology and Evolution/BSc in Geology and Biology

This programme is designed for those who have a broad general interest in the overlapping fields of geology and biology. It is especially appropriate for those who wish to specialise in palaeobiology, which is one of our major research interests. Forgive the different programme names! The BSc is simply years 1-3, and the MSci is years 1-4.

First year

You take the first year of the Geology programme, along with Biology units which cover the diversity of life (evolution, speciation, biodiversity, origins of life) and life processes (cells, genetics, ecology). There is a week's geology field class in the Easter vacation.

Second year

Mandatory units include sedimentology, palaeontology, geological maps and evolutionary biology, and there is a range of options from both disciplines including structural geology, soil geoscience, atmospheric science, developmental biology, conservation biology, insect and parasite biology, behavioural ecology, ecosystems and ecophysiology. There are also palaeontology seminars and a week's geology field class learning the techniques of geological field mapping during the summer vacation preceding the second year.

Third year

In the third year micropalaeontology, evolution of the continental crust, history of the biosphere, and a biology field class are mandatory units, while there is a wide choice of options including oceanography, avian biology, environmental physiology (animal life under extremes), parasites and pests, and evolution of sexual strategies. You also carry out a literature based research project.

Fourth year

The fourth year is half taught and half independent project. You join our MSc in Palaeobiology students, who come to Bristol from many countries to study a popular and successful course that has been in existence since 1996, and has so far had over 150 graduates. You do a mix of compulsory units (scientific communication, palaeontological research methods, current controversies) and choose advanced units related to your enthusiasms, eg taphonomy and palaeoecology. The project continues through this time, and then occupies all your time for the second half of the programme. Get your teeth into feeding habits of *T. rex*, climate change across the KT boundary, early hominid evolution in Africa, or whatever you fancy....

MSci/BSc in Archaeological Sciences

The aim of this programme is to give those with an interest in scientific and practical archaeology the opportunity to acquire expertise in both archaeology and those aspects of geology that are particularly relevant to archaeological fieldwork and research. Emphasis is placed on interdisciplinary approaches to the study of the past, and environmental, experimental and geological perspectives are incorporated into a practical programme of training.

First year

You take the first year of the Geology programme, along with Archaeology and Anthropology units covering comparative world archaeology, biological anthropology, bioarchaeology and fieldwork. There is a week's geological field class in the Easter vacation and an archaeological dig in June.

Second year

Mandatory units include history of archaeology, contemporary theory in archaeology, early human origins, environmental archaeology, sedimentology, archaeological materials, dating science, structural geology, geophysics, soil geoscience and environmental analysis. Fieldwork includes training in archaeological surveying and excavation techniques, an Easter field trip,

currently to Ireland and a week's geology field class learning the techniques of geological field mapping during the summer vacation preceding the second year.

Third year

In the final year, heritage management, human bones in archaeology and biomolecular archaeology are mandatory, and a wide range of options from both departments may be chosen. You carry out an independent field-based research project spanning the two disciplines during the summer between your third and fourth years of study.

Fourth year

The fourth year is half taught and half independent project. There are focused and advanced field trips for the group where you join one of the current research projects in either department. You do a mix of compulsory units (scientific communication, research methods, current controversies) and choose advanced units related to your enthusiasms. The project continues through this time, and then occupies all your time for the second half of the programme. Get your teeth into early hominid evolution, sources of stone tools, Iron age farming, isotopic dating of Pleistocene bones...

I've always been interested in nature, but a trip to Whitby, finding my first fossil, made me realise what I really wanted to do. For years I collected fossils, minerals and every rock that wasn't cemented down. On a GCSE trip to Cornwall for example, I ended up with a backpack full of granite. Both GCSE and A-level geology were available at my school and not even the dullest metamorphic rock could dissuade me for those four years.

I applied for Leicester and Bristol as my top two choices, but knew that Bristol was the place for me. The department of Earth Sciences is housed in the Wills Memorial Building, a neo-Gothic nucleus of the student district. I took biology, general studies, chemistry and geology at A-level, and despite a few hiccups with my Chemistry I managed to get a place on the 4 year masters course in Palaeontology and Evolution. I squeezed in a trip to Iceland (the Mecca of igneous geology), before I came to Bristol and when I did it wasn't long before I was on a field trip to Somerset, meeting people for the first time who loved rocks just as much as me.

Tom Fletcher

The Department

Study abroad

MSci programmes with Study Abroad are offered in **Geology** and in **Environmental Geoscience**, incorporating study in the Earth Science Department of a university in **Continental Europe** (including Iceland), in Australia, New Zealand and Singapore, or **North America** (USA or Canada), with which we have a special arrangement.

These programmes offer a great opportunity for students to broaden their horizons both academically and culturally, which may enhance their future career prospects.

The year abroad replaces the third year of the Bristol curriculum and is followed by the normal fourth year of the MSci programme in Bristol. The assessment of the third year contributes towards the final degree. During the year abroad you pay half the normal annual fees to Bristol but not to the overseas university, and you have to finance your own accommodation and travel expenses during the year abroad.

For the Study in Europe programmes language training, provided by the University Language Centre, is incorporated into the curriculum during the first two years. If you do not have an A-level in the relevant language you must take language units in both the first and second years, but you will need to have at least a GCSE grade C in a European language.

If you have an A-level or are fluent in the relevant language, you may be exempted from the first year's language unit, provided you pass a test conducted by the Language Centre qualifying you to attend the second year's unit. However, language training is not necessary for Iceland and some Scandinavian countries, where the teaching of overseas students is in English.

Field work

Fieldwork plays an important part in all programmes, and students get opportunities to work in interesting and beautiful places, often abroad. Field classes are occasions which bind together a group of students in friendship to an extent not found in most non-field subjects. Students contribute to the costs of the field trips, but the Department subsidises about half the costs as well.

We outline current field trips under the different degree headings. The purpose of field work is to show you things that we have taught you in the classroom. It's all very well to hear about faults, and folds, and volcanoes, but it's much more impressive to see these things yourself. The field trips are very much analytical – not just 'look-see'. We show you things, but you then measure, draw, and analyse to understand how the ancient processes worked. This questioning/ analytical approach is a key to being a good scientist.

Finance and Scholarships

A wide range of financial support is available from the University of Bristol and the Government to make sure you can afford to study for an undergraduate degree whatever your financial circumstances.

Details can be found at http://www.bris.ac.uk/student_finance.

The University awards Bursaries worth up to £1,100 to students in receipt of a full Government maintenance grant. Twelve Vice-Chancellor's Scholarships for students with exceptional artistic, creative or sporting talent are available across the university, and are worth £3,000 per year. (N.B all figures refer to 2006 funding levels.)

Research at Bristol

We do volcanoes, geophysics, geochemistry, dinosaurs, the origin of the Earth and global climate change.

Our research portfolio changes all the time, as new subjects in the earth sciences come to the fore. Science is driven by outside pressures (questions from government, demands from industry, enquiries from people), but also by discoveries. A new way of understanding the core of the earth, the extinction of the dinosaurs, or how oil accumulates in the rocks may open new vistas of research around the world.

Research is international, and our staff and researchers (all 150 of them!) come from all inhabited continents. They are drawn to our labs because of our international reputation, and all students benefit by being in the middle of such a maelstrom of activity and debate and discussion.

You may have read in the newspapers about research done here. Much of the work is high-profile, and staff in the Department are world

leaders in their fields. They frequently appear in television documentary programmes, advise on others (such as 'Walking with Dinosaurs' and 'Walking with Beasts'), and write popular books on geoscience topics. Members of academic staff supervise postgraduate students in these and other research topics, leading to PhD or MSc degrees. The excellence of our work in all fields is reflected in the large number of awards and prizes our staff receive.

Research and teaching are intimately linked. Students are not taught a fixed and formal programme from a recommended textbook. The teaching evolves, and changes as research directions change. You are exposed to state-of-the-art approaches to scientific investigation. The specialist options in your course are taught by internationally recognised leaders in the field in subjects at the cutting edge of Earth Science. You will meet postgraduate students acting as teaching assistants and laboratory demonstrators, and learn from them about some of the latest developments in the subject.

The rifting of continents and formation of new oceanic plates has continually shaped the surface of the Earth, yet the mechanisms that control this fundamental process are not fully understood. The Afar depression of northern Ethiopia represents the divergent margin between the Arabia, Nubia and Somalia plates. Extension in this region is so advanced that it is effectively a nascent oceanic spreading center that is not yet covered by an ocean (parts of Afar are actually 100's m below sea level). Over approximately 3 weeks in late September 2005 – an instant in geological time – a historically unique series of events dramatically ruptured a 60 km portion of the Afar plate boundary by an estimated 8 m. This occurrence was accompanied by 1000's of earthquakes, fissures, and volcanic activity. Scientists from the UK, USA and Ethiopia reacted quickly and a detailed programme of research has been funded by the Natural Environment Research Council for 5 years; Bristol earth scientists are leading many facets of this £3.8 million project.



Fieldwork in the region is challenging due to an inhospitable hot climate and political tension. Access to the area is via 4wd vehicle, camel or helicopter. Scientists consume over 8 liters of water per day while in field. Volcanic rock samples will be used to study the petrology (Prof. Blundy) and geochemistry (Prof. Hawkesworth) to better understand the magma source and timing of rifting events. A network of seismometers has been deployed to monitor seismicity patterns and image the magma source at depth (Profs. Kendall and Helffrich). The eruption highlights the significant volcanic hazards in Afar; Professor Sparks is leading the creation of a hazard assessment programme for this developing region. Collectively, Bristol and its research partners will develop a better understanding of continental rifting and the formation of oceanic crust through studies in this unique natural laboratory.



The University of Bristol

History

University College Bristol, founded in 1876, was the first institution in the United Kingdom to offer places to women to study in higher education on the same footing as men. The University of Bristol was granted its royal charter as a university in 1909, since when it has grown to about 11,000 undergraduate students pursuing programmes in six faculties.

The University is in the area of Clifton, famous for its Georgian and Regency terraces and Brunel's spectacular suspension bridge which spans the Avon Gorge. It is very much a part of the city and there are first class shops near to the University precinct. Four of the Halls of Residence are close by in Clifton, while the remaining six are in the neighbouring leafy residential area of Stoke Bishop next to the extensive parklands called The Downs. There are also a number of Student Houses.

The University Union has one of the largest Union buildings in Europe which contains a full-sized swimming pool, theatre, large hall, meeting rooms, shops, bank, three bars, travel bureau, restaurant, snack bar, hairdresser, launderette, video and CD library, music practice rooms and quiet study rooms. It also houses the second largest venue for gigs in Bristol. All full-time students are entitled to be members of the University Union, which provides facilities for over 150 clubs and societies.

The Athletics Union, part of the Union, is responsible for the organisation of over 40 sports clubs. There is an indoor sports centre within the precinct and the University sports ground, which includes two floodlit artificial grass pitches and an indoor tennis complex, is near to the Stoke Bishop Halls of Residence. The Avon Gorge and the Mendip Hills provide

Accommodation

The University guarantees to provide accommodation for new full-time students, other than mature students, who have firmly accepted an offer. Priority is given to those living outside the Bristol city area, but those within this area are also welcome to apply for university accommodation. Some of the Halls of Residence are fully catering while others are self-catering. They offer facilities such as libraries, computer networks to the main campus, common-rooms, bars, squash and tennis courts and gardens. Each Hall is administered by a Warden, but the organisation of student social life and recreation is in the hands of elected student committees. There are also some self-catering student houses which provide communal kitchens and common-rooms and are under the supervision of a Senior Resident.

If you make Bristol your firm choice you will be sent, in May, details about accommodation and you can then let us know your preferences.

excellent opportunities for climbing and caving, while rowing and sailing take place on nearby rivers, canals and lakes.

The University has three theatres and several orchestras, choirs and other music groups to suit all abilities. Each Wednesday lunchtime there is a free concert in the University, open to the public.

Careers

Every year, all our students who seek jobs find jobs. Many take a year out to travel round the world, sometimes doing voluntary work overseas, and so the employment figures do not read as 100%. Many large-scale employers visit Bristol each year to secure large numbers of science graduates – not specifically earth sciences graduates alone – and they see our degrees as ideal for careers in banking, consultancy, business and commerce.

The University of Bristol has a strong reputation, and it is in the top five or six in the country that are visited by major employers seeking science and engineering graduates.

Job prospects in some geological businesses, particularly in the petroleum, gas, mining and mineral industries, may be affected by economic and political factors. There is always a need for geoscientists in civil engineering projects and in the water resources industry, and with the increasing awareness of the importance of the environment, geoscientists are increasingly being employed in the fields of nature conservancy, waste disposal, pollution and environmental planning. Many also find jobs in the new and expanding media/ education sectors – the BBC, independent film makers (of which there are many in Bristol), and the new hands-on science museums.

Many of our graduates go on to take advanced degrees - MSc or PhD prior to a career in industry or research.

Advice on careers in Earth Science and further degrees is provided by tutors and individual members of staff in their particular discipline, as well as by the University Careers Advisory Service.

"I'm enjoying my university experience so far. I like Bristol because it is diverse, with people of every nationality. I've found living in Bristol very comfortable and convenient. I knew I would have hall accommodation, where everybody is new to university, so there were no worries. I live in a catered hall, which is very close to university.

My main interest outside studying is sports. I have the privilege of representing the university in track athletics. This gives me the opportunity to travel around the UK and meet other university students.

I got interested in topics such as tectonics, orogenesis, metamorphism and a host of others while studying Physical Geography in school. I thought Geology would be the course for me. Besides, I would have good prospects of working in the petroleum industry in my home country, Nigeria, with a degree in Geology.

The course meets my expectations and it combines all three science subjects I studied during my IB. It's a good combination of practical classes and lectures. I find the field classes and trips most interesting because I like getting outdoors and I get to see the sites for myself.

My advice is to choose a course you will find interesting so that you can enjoy yourself while studying for a degree. Moreover, your interest will keep you going when it gets difficult."

Diekumo Anthony, Level 3 BSc (Hons) Geology. From Port Harcourt, Nigeria, via The British School of Lomé, Togo. IB with Chemistry, Biology and Geography at Higher Level.

The City of Bristol

Bristol is a thriving modern city which developed around its harbour about 1,000 years ago and it is one of the most attractive large cities in England, with easy access to some beautiful countryside. The harbour area is now a focus for cultural and leisure activities, and there are wide open spaces and extensive woods within the city boundaries.

The arts flourish in the city, with opera, ballet, film, theatre and concerts of all kinds. The Bristol Old Vic Theatre Company is based in the 18th century Theatre Royal, the Colston Hall is an international concert hall and the Hippodrome has one of the largest theatre stages in the country. There is a lively pub music scene, from heavy metal to jazz, and night clubs abound.

Bristol has two league football teams, first class rugby union teams, and is the home of Gloucestershire County Cricket Club. In and around the city there are plenty of pleasant pubs and restaurants providing food from many different nations.

The city has excellent road, rail and air communications with the rest of the country and is 100 minutes by road from Heathrow Airport. Bath, Wells, Glastonbury and Cheddar Gorge are all within easy reach, and the countryside of Gloucestershire, Dorset, Somerset, Devon and Cornwall, as well as Wales over the Severn Bridges, is only slightly further afield.



How to apply

Entry requirements

As a preparation for a degree in Earth Science you will need to have a good background of basic science; the best subjects to study at A-level are chemistry, mathematics, physics, biology or geography. Chemistry is needed for all single honours programmes and there is an opportunity for you to take an elementary unit in this as a subsidiary subject in your first year here if you do not have it at A-level. A mathematics background is also helpful. No previous knowledge of geology or environmental science is necessary, although we do of course welcome people who have studied these subjects before.

Normally three A-levels, at least two and preferably three in science subjects, are required for entry. At least one additional AS-level is expected. Usual offers are ABB or an equivalent score in A-levels. Other qualifications are also considered, particularly from mature students whose education may have followed a less traditional course. Grade C in GCSE maths and science is required for all programmes.

If you look likely to meet our standard offer, you will normally be invited to Bristol for an

open day, when you will be shown around the Department, be able to chat with some of our students over a buffet lunch, and have a small-group meeting with a member of staff when you can ask the questions you are bound to have. There will also be a tour of a Hall of Residence and of the campus.

N.B. Study abroad programmes are becoming increasingly popular and overseas universities are placing strict quotas on numbers of incoming students. Competition for places is strong, and progression into the second year is on a competitive basis both at a departmental level and at the level of the overseas university. Students not awarded places abroad complete their degrees in Bristol.

Transfers

Transfers between all Earth Sciences programmes, either before starting or during the course, are usually possible. If you wish to change programme subsequent to an application but prior to coming to Bristol, then write to the departmental Admissions Tutor or mention it if you attend an open day. If you are in doubt about the choice between a BSc and an MSci programme it is generally advisable to choose the MSci in the first instance with the option of transferring to the BSc later.

Further information may be obtained from:

The Admissions Tutor
Department of Earth Sciences
Wills Memorial Building
Queen's Road
Bristol
BS8 1RJ

Telephone: (0117) 954 5400
Fax: (0117) 925 3385

E-mail: earth-undergrad@bris.ac.uk

Web: www.gly.bris.ac.uk/www/admissions/study.html

