What is Hydrogeology?

Hydrogeology is the study of groundwater; an essential component of the world's water supply. More than 2 billion people depend on groundwater for their daily needs (approximately 30% of water supplied in the UK is groundwater).

Groundwater maintains surface water systems through flows into rivers and lakes, and is a vital support for many terrestrial ecosystems. Its impact on the strength of soils and rock is a fundamental component in planning the built environment.

Many hydrogeologists have geoscience backgrounds, but there are major roles to be played by those from other scientific and engineering disciplines. Hydrogeology needs physicists, chemists, engineers, mathematicians, and biologists as well as geoscientists to manage and protect this invaluable resource. Technical disciplines in hydrogeology include groundwater flow estimation, hydraulics and modelling; water chemistry including combinations of bio-hydro-geo-chemistry; hydrogeophysics; and hydroecology. The application of these specialisms is wide-ranging including: water resources hydrogeology; contaminant hydrogeology, including the assessment of plans for radioactive waste disposal; soil and rock mechanics; and even mineralization, tectonics and diagenesis.

Although hydrogeologists work in many applied and research fields, many specialize in water resources or in contaminant hydrogeology. In these fields, the 'general practitioner' is expected to have a basic knowledge of the technical disciplines listed above, and be able to use this understanding to solve practical problems. A hydrogeologist may be required, for example, to determine the risk to a public supply well from a contaminant spill, or quantify the amount of potable quality water that may be sustainably abstracted from an aquifer system.

Hydrogeology needs both generalists and specialists. There are many problems that require an ability to develop modelling techniques, and here a hydrogeologist with a mathematics, physics or engineering background would be appropriate, often working in collaboration with a colleague with a more geoscience oriented background. Similarly, chemists or microbiologists are needed to assess biodegradation reactions, a geophysicist would be required to image the movement of leachate from the base on an old landfill, and since groundwater occurs in the subsurface, the understanding of geoscientists is central to high quality hydrogeology. The MSc Hydrogeology Course at Birmingham is taught by the Hydrogeology Research Group, which comprises geologists, a civil engineer, a mathematician, an organic chemist, and a microbiologist/chemist. There are extensive possibilities for geoscience and non-geoscience graduates in hydrogeology!

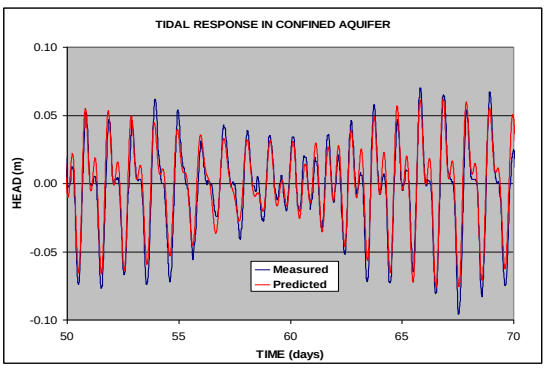
For more background, see the UK Groundwater Forum website, which promotes an understanding of groundwater in the UK. (www.groundwateruk.org/)

Employment

Graduates take up careers in consultancy, in the UK or abroad, or join regulators such as the Environment Agency or government scientific services like the British Geological Survey, and others move into research or work in water supply companies.

Although some consultancies specialize, many undertake a very wide range of groundwater-related work providing consultants with interestingly varied careers. Work may involve anything from siting wells for water supply in the UK to village wells in hard rock terrains in a developing country, from contaminated land assessment to designing landfills, from developing Environment Agency procedures and techniques to researching radioactive waste disposal facilities, from assessing wetland water balances to determining water level changes for subsidence estimation. The vast majority of jobs are far from routine, each presenting its own challenges. In the Environment Agency you may find yourself becoming an expert on the hydrogeology of your region, making sure that the groundwater systems are protected for future generations or, often partly through commissioning work from consultants, developing new procedures and policies, and techniques for implementing them. This will often require detailed knowledge of legislation fundamental to the future of the UK water industry, including that from the European Union such as the Water Framework and Groundwater Directives. The British Geological Survey is a major employer of hydrogeologists, and undertakes a wide variety of work in the UK and overseas. Many water companies also employ hydrogeologists, who undertake work ranging from source maintenance and protection to researching new ways of developing existing resources.

Over our 30 year history, there has never been a problem in gaining employment in groundwater. Each year, around 20 companies come to our careers fair and even over the last two years, employment rates have remained high, with employers regularly contacting us with job vacancies.


TIDAL RESPONSE IN CONFINED AQUIFER
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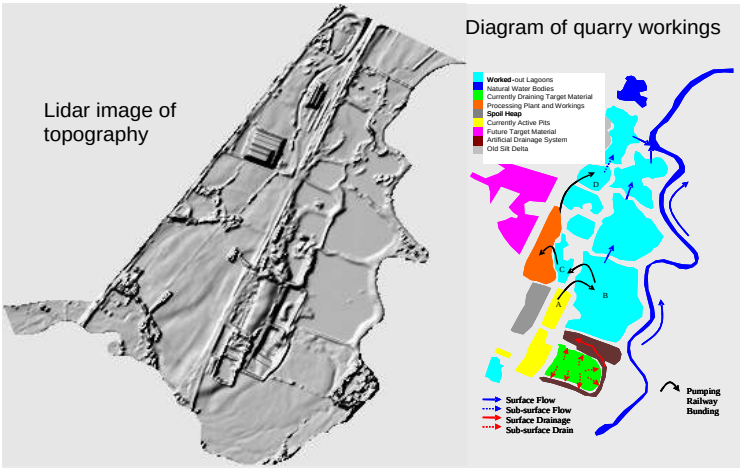

Lidar image of topography
Diagram of quarry workings
Worked-out Lagoons
Natural Water Bodies
Currently Draining Target Material
Processing Plant and Workings
Spoil Heap
Currently Active Pits
Future Target Material
Artificial Drainage System
Old Silt Delta
Surface Flow
Sub-surface Flow
Surface Drainage
Sub-surface Drain
Pumping
Railway
Bunding

About the course

The aim of our Hydrogeology MSc Course is to provide students who have a good scientific or engineering background with a comprehensive training in the fundamentals of hydrogeology, together with considerable practical experience.

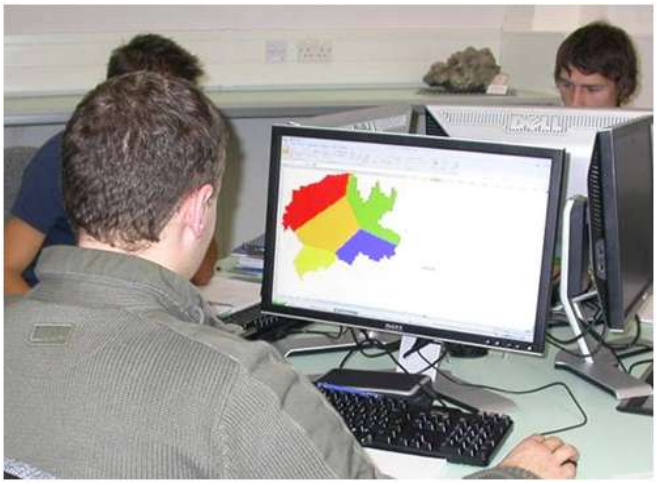
The course covers all major areas of groundwater resources, groundwater pollution and remediation, and groundwater engineering. Groundwater conditions are treated on an international basis and there are usually opportunities each year for students to undertake project work abroad.

The course is the longest established hydrogeology course in the UK, having been set up in the early 1970s, and as such its alumni are spread throughout the industry. Around 24 students in total take the course each year, coming from a wide range of backgrounds, from the UK, other parts of Europe, and further afield.

Over its 30 year history, the MSc Course in Hydrogeology has changed considerably, keeping in step with major changes in the subject, the concerns of the industry, and vastly increased computer power. Uniquely for a UK university department, there are now five core members of hydrogeological staff; specialists covering chemical, microbiological, geological and modelling aspects of the subject.

The course runs over 12 months from October to September. In the autumn and spring terms the subject is developed in lectures and practical sessions interspersed with fieldwork, a seminar series and at least one visit to a national hydrogeological meeting. Some modules are assessed partly or completely through coursework. The remainder are assessed by one examination in January and four in April, after which students undertake an extended individual project.

There is also a ‘split registration’ option in which it is possible to study the taught elements of the course over two consecutive years, the independent project being completed before the end of September in the second year.



Taught Module Outlines

The Course has 12 taught modules, each representing 10 credits. The individual project is worth 60 credits.

1. Groundwater Flow and Transport Theory

Aim: to introduce the physical processes controlling groundwater flow and solute transport, and the mathematical and numerical models used to describe them.
Content: the fundamental principles of flow and storage in porous media; the general form of Darcy’s Law; groundwater flow and storage in aquifers; the physical processes governing solute transport in groundwater; analytical models of groundwater flow patterns; the advection-dispersion equation and simple analytical solutions; and elementary concepts of finite difference modelling.

2. Surface Water Interactions

Aim: to explore the interactions between surface and subsurface water systems including streams, rivers and lakes, and how to measure and quantify the fluxes at the interface.
Content: The hydrological cycle. Meteorology, precipitation and evapotranspiration. Unsaturated flows and groundwater recharge. Stream flows and stream/aquifer interactions. Lumped catchment water balance modelling (requiring an introduction to Visual Basic for Applications programming).

3. Hydraulic Properties

Aim: to acquire knowledge of the full range of available hydraulic laboratory and field tests and when and how to apply these.
Content: Heterogeneity. Laboratory methods for porosity, permeability, storage, surface area etc. Small and large scale field tests for permeability and storage under different conditions. Well efficiency tests. A week of fieldwork.

4. Borehole Design, Construction, and Maintenance

Aim: to show how to design, construct and maintain boreholes in different physical and social settings and for objectives of water supply, monitoring and dewatering.

Content: Methods of groundwater exploitation. Drilling, logging, and sampling. Pumps. Well design and construction. Monitoring wells. Well maintenance and rehabilitation. Construction dewatering.

5. Environmental Geophysics

Aim: to explain and demonstrate the theory and practical application of borehole and surface geophysical methods to hydrogeological assessments.

Content: Principles of geophysical techniques for shallow subsurface imaging with emphasis on electrical and electromagnetic surveys. Wireline logging. Applications to groundwater.

6. Groundwater Management and Exploitation

Aim: to extend the principles introduced in Groundwater Flow and Transport Theory to cover more complex flow systems and methods of analysis, and to introduce groundwater and project management procedures.

Content: Characterisation of the physical and hydraulic properties of fractured and fractured porous aquifers, saline intrusion and salt-water upconing, aquifer deformation and consolidation. Establishing projects and contracts for groundwater exploration and management of groundwater.

7. Inorganic Chemistry and Groundwater

Aim: to understand aqueous inorganic chemistry and to interpret groundwater chemistry data sets in the context of water-rock interactions to solve problems of regional flow and pollution.

Content: Theory of dissolution/precipitation, acid-base, redox, and sorption reactions. Isotopes. Application to water resources and contaminant hydrogeology.

8. Organic Contaminant Hydrogeology

Aim: to understand the fate of organic chemicals in the subsurface and to identify appropriate groundwater protection and remediation strategies for waste disposal and contaminated land.

Content: Contaminant sources (pesticides, solvents etc), toxicology and legal standards. Organic chemistry. NAPL migration. Waste disposal and landfill design. Site investigation and risk assessment. Case histories.

9. Regional Groundwater Flow Modelling

Aim: to provide an introduction to regional groundwater flow modelling; to refine skills in conceptualising groundwater systems from limited data; and to introduce professional groundwater modelling software.

Content: Conceptual modelling. Mathematical models. Numerical modelling methods and approximations. Modelling practice. Case studies. Flow modelling project using a proprietary modelling system - G/W Vistas (+MODFLOW).

10. Contaminant Transport Modelling

Aim: to extend the basic theory introduced in Groundwater Flow and Transport Theory, and to introduce and apply the methods commonly used in modelling solute transport in different types of aquifer.

Content: Review of conservative and reactive transport principles. Consideration of colloid transport processes. Models for dual porosity and multi-phase systems. Application of contaminant transport software - MODPATH and MT3D.

11. Water Resources Studies

Aim: to understand how hydrogeological assessments are structured and to develop ability in hydrogeological interpretation and water resources assessment for different geological settings, physical domains and exploitation proposals. To understand how the various aspects of hydrogeological investigation are integrated. To gain an introduction to the UK hydrogeological community.

Content: Guided research on topics including regional sandstone, UK chalk, and karst aquifer development; exploitation of hard rock aquifers in semi-arid regions; nuclear waste disposal; protecting wetland systems; and aquifer storage and recovery.

12. Contaminated Land – Groundwater Remediation

Aim: to understand the occurrence of and risks posed by contaminants in contaminated land and groundwater and to identify appropriate groundwater protection and remediation strategies for contaminated land and waste disposal activities.

Content: Contaminated land legislation, risk assessment, diffuse contamination, NAPLs, site investigation, and monitoring; groundwater protection by barriers and land use planning; groundwater remediation methods.

For those requiring it, there are additional supporting sessions at the start of the year on those mathematical concepts relevant to the course.

Fieldwork and projects

Fieldwork and projects transform theory into practice and form a large part of the course. They are supported by extensive field, laboratory and workshop facilities.

Field work

A weeklong course of practical work and site visits is held in Week 7 of the autumn term. The content varies from year to year, but typically includes pumping tests, small-scale field tests, chemical sampling, and geophysics using the research boreholes on campus. Visits to landfill sites, water resources schemes, wetlands, and drilling sites are also arranged in collaboration with the Environment Agency, consultants and landfill operators. During the spring term, field demonstrations are provided by chemical sampling equipment distributors and manufacturers. Students gain further field experience either during their own 5-month projects or when helping their colleagues on other projects.

Projects

Individual projects are undertaken from the beginning of May through to the middle of September. Projects are chosen from a list of around 50 topics suggested by the staff and outside organizations. We are also happy to consider projects of a student's own devising: sometimes, for example, a student already in employment may wish to undertake a project associated with the job they will return to.

Projects may be associated with outside organizations, typically consultants, the Environment Agency, or the British Geological Survey. However, all projects are supervised by one or more of the hydrogeology staff: the projects are not placements, but well-focussed pieces of work.

Other projects are associated with research programmes within the Group, and these will often involve PhD students and research staff. Usually there are a few opportunities for overseas projects, and in recent years students have undertaken projects in France, Brazil, Argentina, El Salvador, and South Africa. Recent example projects include:

- The migration of viruses through sandstone aquifers
- The impact of groundwater abstraction on the Potford and Platt surface water catchment, Shropshire
- Dewatering assessment for an African cement mine
- Modelling the effect of fracture morphology on hydraulic properties
- An investigation of chlorinated solvent plume discharge and attenuation in river beds
- The effects of turbulent flow on groundwater recharge
- Modelling a groundwater dam in an alluvial ribbon-valley in Pernambuco, NE Brazil
- Developing a water management strategy for industrial abstractions in Trafford Park, Manchester
- Estimation of local-scale contaminant fluxes in groundwater via multilevel piezometers
- A hydrogeological classification and ranking system for site environmental assessment of the ground storage of building energy
- Geochemical processes in an arsenic and fluoride contaminated aquifer, Cordoba Province, Argentina
- Sustainable management of groundwater resources in the Rosario-Mimoso Valley, NE Brazil
- Investigation into the behaviour of organic gasworks contaminants at complex multi-source sites
- Investigation of the attenuation capacity of the Triassic Sandstones for heavy metals using the geochemical model PHREEQC
- The development of a flow meter for hyporheic zone (sub-river zone) flows

All students give a presentation on their project in July, when they are also interviewed by the External Examiner for the Course.

Laboratory and field facilities

The School is well supported and students have the use of any equipment and facilities appropriate to their work:

Computing

Students have access to the multiple clusters of PCs in the University Learning Centre and Library, and the School-based Earth Imaging Laboratory. The MSc course also has its own dedicated room for teaching and study with 6 PCs for convenient access to email, web and on-line learning resources. The University based computers have an extensive range of software installed that covers the needs of students of all disciplines, but in common with the School-based PCs, specialist software packages used routinely by professional hydrogeologists are installed for our MSc students. These include industry standard groundwater flow modelling, contaminant transport modelling, geochemical modelling, geophysical interpretation and field and laboratory hydraulic test analysis packages. Students can also register for more specialist software on the University high speed BlueBEAR computing facility if their individual project requires it. Research software developed within the Hydrogeology Research Group is also available.

Laboratories

The School is well equipped for inorganic and organic chemical analysis of field and laboratory samples. Facilities include: Total Organic Carbon analysis, Gas Chromatography, ICP Mass Spectrometry, Ion Chromatography, Stable Isotope Mass Spectrometry and Luminescence and UV/visible spectroscopy. These facilities have been used in a wide range of MSc projects, for both standard geochemical analysis of groundwater samples and for more specific purposes including studies of persistent organic pollutants and toxic heavy metals in the environment, and denitrification in river beds.

The School also has a dedicated microbiology laboratory equipped with an autoclave for sterilizing media and equipment, a class II safety cabinet for handing microbial samples, and incubators.

Facilities are also available within the School and elsewhere for geological material analysis, including thin section preparation and microscopy, a wide range of electron microscopy techniques, XRD, pore size distribution determination, and surface area measurement.

Field Facilities

The School has two field sites on campus for use by MSc students and the research staff. Both consist of arrays of boreholes drilled into the underlying sandstone aquifer to depths of up to 60 m.

Field Equipment

The Hydrogeology Research Group is well stocked with field equipment, which is used extensively in research projects, for teaching, and particularly on individual MSc projects. This equipment includes pumping test equipment (submersible pumps, generators, packers, digital pressure transducers, data loggers, divers, dip meters, pipe-work and installation frames); chemical sampling and tracer transport equipment (depth samplers, sampling pumps, tracer test equipment and field fluorimeter, hand held EC, pH and Eh meters, portable chemical lab kit); geophysical equipment (resistivity imaging, electromagnetic surveying, and ground penetrating radar); and a secure, towable, mobile laboratory for off site testing.

Workshop

Fieldwork is supported by a well-equipped technical workshop.

Technical Support

Computing, rock sectioning, chemical and microbiological technicians provide support in addition to research associates involved with specialist field and laboratory technology.

Staff profiles

Hydrogeology is a strongly interdisciplinary subject and the MSc teaching team reflects this with backgrounds and expertise spanning Geology, Engineering, Chemistry, Microbiology, and Mathematics.

Each member of the team also undertakes a range of innovative research that informs the teaching on the course and provides excellent opportunities for MSc students to get involved in developing their own research interests and skills. The team also has strong links with industry that facilitate students working on problems with companies for their summer projects.

Rae Mackay, Professor of Hydrogeology

Rae has a Civil Engineering degree from Imperial College (1978) and a Hydrogeology PhD from Newcastle University. Before developing an academic career he worked for several years overseas as a water resources engineer and acquired his early hydrogeological knowledge in the field in Saudi Arabia, Yemen and Pakistan. His current hydrogeological interests are broadly based reflecting his engineering background. These cover groundwater engineering, groundwater pollution and the modelling of contaminant transport in geologically complex aquifer systems, the use of urban groundwater (urban drainage, water supply, and thermal energy storage and transmission) as well as improving groundwater knowledge and management practices in arid and semi-arid regions.

Michael Riley, Senior Lecturer in Hydrogeology

Mick has a BA in Philosophy, a BSc in Mathematics and an MSc in Engineering Hydrology. He works primarily on the development of mathematical and numerical models describing the processes affecting the movement of contaminants (solutes and inorganic and biological particles) in groundwater. He has a particular interest in the hydrogeology of fractured rocks, but has also explored other Earth Sciences issues including the degradation of proteins (collagen and DNA) over archaeological timescales, and the investigation of methane hydrate accumulation and release below the sea-bed.

John Tellam, Professor of Hydrogeology

John gained Geology and Hydrogeology BSc and MSc degrees before completing a hydrogeology PhD in 1983. He has wide ranging interests in quantifying geochemical processes in groundwater systems affecting solute and particle transport, especially surface-related processes in continental sandstone aquifers. He is currently investigating the transport and fate of viruses in groundwaters, and is in the early stages of exploring the movement of manufactured nanoparticles in groundwater, again an extremely important topic for study given the rise of nanotechnologies and the potential health and environmental impacts. He is on the Council of the Geological Society of London and the steering group for the UK Groundwater Forum, a body concerned with promoting awareness of groundwater understanding in the UK.

Michael Rivett, Senior Lecturer in Hydrogeology

Mike gained his MA in Chemistry at Oxford (1985) and went on to undertake a PhD in Organic Contaminant Hydrogeology at Birmingham before relocating to Canada to carry out field based groundwater research on non-aqueous pollution source zones. He subsequently worked for a period with the UK Environment Agency before recommencing his academic career. His interests are on the natural attenuation of groundwater contaminants, groundwater and contaminated land remediation, chlorinated solvents in groundwater, the historical contamination of groundwater and the interaction between groundwater and surface water. Mike was until recently on the Council of the Geological Society of London and Chairperson for the Geological Society's Hydrogeology Group.

Joanna Renshaw, Lecturer in Hydrogeology

Joanna has a Natural Sciences degree from Cambridge followed by a PhD from Manchester during which she investigated iron complexing compounds produced by fungi and their impact on radionuclide chemistry. Jo's principal research interests are microbial transformations of radionuclides and metals and the biogeochemistry of metals and organic pollutants in groundwater, which is highly relevant to addressing the future sustainable use of groundwater. Her current and recent research includes: applications of biogeochemistry in radioactive waste disposal and remediation; biogeochemical and hydrogeological processes controlling radionuclide migration; phytoremediation of toxic organic pollutants from crude oil contamination in the Niger Delta; and interactions of nanoparticles with bacterial biofilms.

Student profiles

We believe that studying on the MSc Course is a rewarding experience. The University, the City, the Course and its staff have a great deal to offer. Below are a few comments from recent graduates and leading members of the hydrogeological community.

Helen Bonsor (Hydrogeologist, BGS)

I studied Hydrogeology at Birmingham after the course was recommended to me by professional Hydrogeologists within the UK. The decision to study at Birmingham was a wise one, with the course providing excellent teaching on all core aspects of Hydrogeology. Equal emphasis is given to both the theoretical and applied aspects of hydrogeological work within the MSc and the degree provides a comprehensive basis to anyone beginning a career in Hydrogeology.

Since completing the MSc in September 2008 I now work as a Hydrogeologist within the British Geological Survey, where I am involved in both government-funded and commissioned research in key issues of groundwater science and management. The work is diverse and for a broad range of clients including environmental regulators, national and local government, water companies, industry and private individuals. In times of population growth and climate change understanding groundwater resources is vital and hydrogeology is a very exciting area in which to work.

Neil Gray (Principal Consultant, Contaminated Site Management, ERM UK)

Since graduating from Birmingham in 1999 I have worked in the field of contaminated land. I have worked as a Hydrogeologist throughout the UK and internationally over the last nine years focussing on contaminated site investigation, controlled waters risk assessment and groundwater remediation. The MSc in Hydrogeology gave me an excellent start in my career by providing me with both technical knowledge and a general awareness in my chosen field. The course provided an understanding of contaminant migration from first principles and introduced the fundamentals of undertaking controlled waters risk assessments. During the course we were introduced to drilling methodologies and sampling techniques which provided me with confidence during my early days on site undertaking site investigation. The course is well respected throughout the environmental consultancy industry and is always one which puts a CV to the top of the pile.

Sarah Lyle (Hydrogeologist, WMC)

I am currently working as a project hydrogeologist with Water Management Consultants – a Schlumberger Company in Santiago, Chile. The majority of our work is conducted for the mining industry and is extremely varied. In this way the Birmingham course was great preparation, not only for the huge breadth of topics covered but also for applying theory to real datasets, preparing written work, giving presentations, working to deadlines and coming to the realisation that very often there is not a 'right answer'. The final lesson was the hardest to learn, but the course gives you the tools necessary to differentiate between a logical, well argued solution and ones that give plausible numbers but do not represent reality.

In my final term at Birmingham I was lucky enough to travel to Brazil to conduct fieldwork for my dissertation. Others travelled to South Africa and there were placements throughout the UK. This is another strength of the course, they have enormous numbers of contacts within both academia and industry and so the opportunities are vast. The course is held in very high regard and an MSc from Birmingham will stand you in extremely good stead for a career in the water industry.

Alex Bond (Senior Consultant, Quintessa Ltd)

I work for an employee-owned scientific and mathematical consultancy working in all environmental areas, but focussed particularly on radioactive waste management and disposal, and carbon-dioxide capture and geological storage (CCS). Currently, I lead and contribute to international work in these diverse areas, and have to apply my background in the physical sciences to real problems in an appropriate and pragmatic manner. The MSc in Hydrogeology helped me learn how to do this in an interesting and extremely relevant area of applied science, from which I have been able to develop my scientific interests and expertise further.

Following the course, I developed the work from my MSc project further and gained a PhD in Hydrogeology at Birmingham. I then worked for the Research and Technology branch of BNFL, on hydrogeological modelling and safety assessments for radioactively contaminated land. The combined experience to this point gave me sufficient expertise and personal contacts to be able to help open a new office for Quintessa in the North-West of England where I primarily work on CCS, the detailed modelling of coupled physical processes, and safety assessments for major international waste management projects.

Richard Andrews (Director - Industrial Sector Europe for URS Corporation)

What did you think of the course?
Very good, especially the more applied aspects. It has given me a very good grounding and I have called on pretty much all of what I learnt at one time or another over the last 20 years or so.
What you have done since graduating?
Worked as a hydrogeologist for Dames & Moore, then URS for the entire period, dominantly in the area of contaminated land, particularly investigation and remediation of contaminated sites.
What influence has the course had on your career?
An immense one! Along with my PhD (also from the Birmingham Hydrogeology Group), it has shaped my entire professional career in terms of laying down a fundamental baseline of understanding of hydrogeology and its application in the 'real world'.

How to apply

Qualifications

The course is open to graduates who hold a good honours degree or an equivalent qualification from the full range of science, engineering and environmental disciplines. The course is quantitative and teaches the principles underpinning Hydrogeology to a high level. It introduces participants to many quantitative skills and methods and applicants are required, therefore, to demonstrate an adequate level of ability in mathematics that will allow them to gain the most from the course and to work effectively in their future career. An AS or A-level in Mathematics or an equivalent through their degree course or through appropriate tuition is sufficient.

UK Candidates

There is no general closing date for the receipt of applications, but places are restricted and early submission is advised. If you would like to visit the University before or after applying, please contact the Course Tutor, John Tellam (J.H.Tellam@bham.ac.uk; 0121 414 6138): note that also the University organizes postgraduate Open Days, details of which can be found from a link on the University home page (http://www.birmingham.ac.uk).

Overseas Candidates

Overseas candidates whose permanent home address is outside the UK should submit applications not later than 31st May of the year in which admission is sought in order that there is plenty of time to complete the formalities. Applications received after that date may be considered provided vacancies still exist. Application from overseas candidates should be accompanied by:

(i) A transcript of the candidate's academic record showing the subjects taken and the grades achieved in each qualification obtained.
(ii) Evidence that the candidate would have sufficient funds available in the event of admission being granted.
(iii) Evidence that the candidate has reached a satisfactory standard in written and spoken English. Details on accepted qualifications and English language courses can be found at: http://www.postgraduate.bham.ac.uk/entry/international.shtml

Without these documents the application cannot proceed.

PET scanner used to image DNAPL migration through fractured rock

On-line applications

An on-line application can be made on the University's website at:
http://apply.bham.ac.uk/cp/home/loginf

An application form and related documents, including details of how to apply, can also be downloaded from
http://www.postgraduate.bham.ac.uk/apply/

If you do not have access to the above sites, please contact Professor John Tellam for an application pack.
Email: J.H.Tellam @bham.ac.uk

Further Information

If you need further information about the course or if you have specific admissions questions please contact:

Professor John Tellam
Earth Sciences
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Edgbaston
Birmingham B15 2TT, UK
Tel: +44 (0)121 414 6138
Fax: +44 (0)121 414 4942
E-mail: J.H.Tellam@bham.ac.uk

More about Birmingham

Useful links

You can learn more about the University and the opportunities that it provides by looking at the following web sites:

University
- www.bham.ac.uk

School
- www.gees.bham.ac.uk

Accommodation
- www.has.bham.ac.uk/studentaccom/

Birmingham
- www.about.bham.ac.uk/maps/

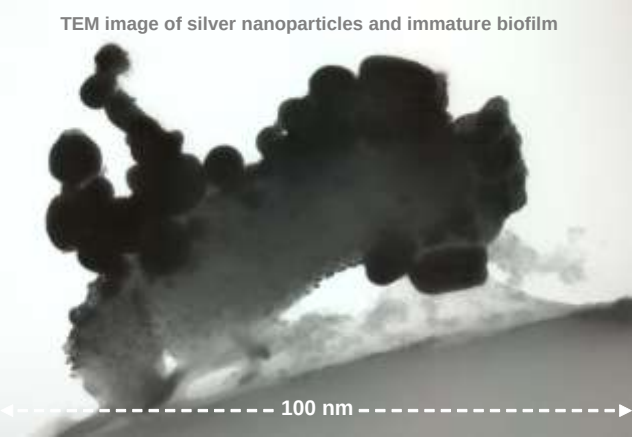
Postgraduate study
- www.postgraduate.bham.ac.uk

For International Students

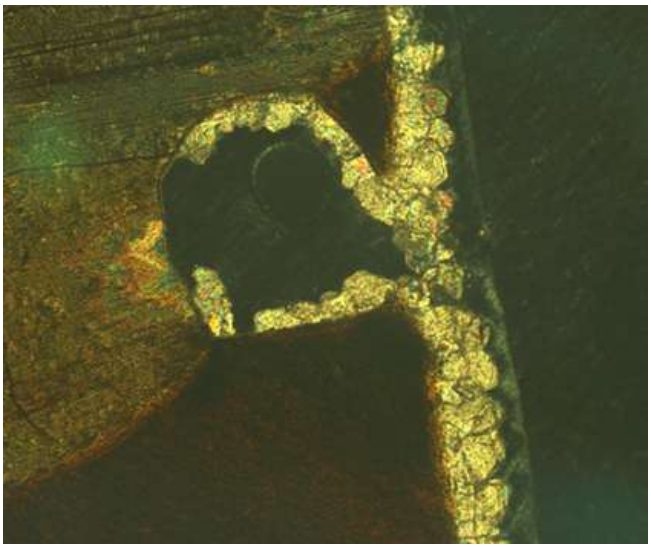
General Information
- www.postgraduate.bham.ac.uk/international

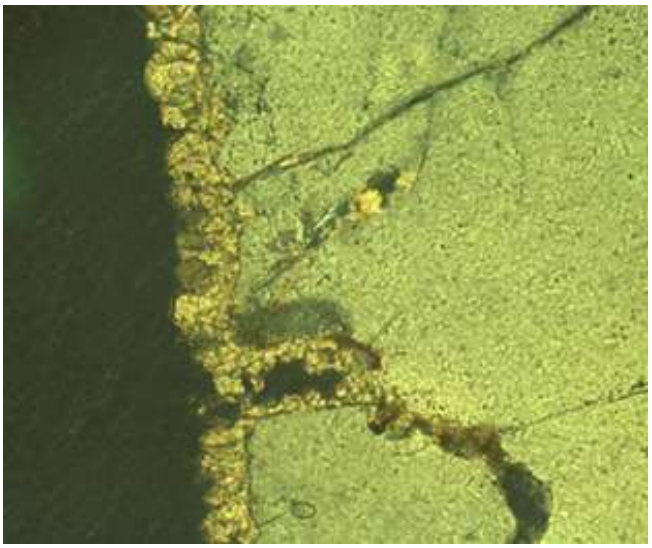
Language skills
- www.postgraduate.bham.ac.uk/entry/international.shtml

Scholarships
- www.birmingham.ac.uk/international/students/finance/scholarships/index.aspx



Calcite crystals bridging pores in granite surface





Frequently asked questions

1. Does the MSc Hydrogeology at Birmingham have an established track record and is it held in high esteem?

It is the longest running MSc course in the UK with an international reputation for quality. It commenced in the 1970s and has developed and changed throughout its long run in response to the needs of the industry. Graduates of the course are in strong demand and employment of graduates has been consistently high since the course started.

2. What are the key attributes of the MSc and why should I study at Birmingham?

a. It provides a comprehensive training in the theory and practice of hydrogeology that will give the best start for your future professional development.
b. It is delivered by five hydrogeologists with strong track records and backgrounds covering Earth Sciences, Civil Engineering, Mathematics, Chemistry & Microbiology.
c. It offers excellent career prospects in scientific, engineering and environmental consultancies, water companies, major industries, and university research as well as government scientific and regulatory services in the UK and abroad.
d. It is part of a very highly regarded University with excellent facilities and excellent opportunities for activities outside of the academic programme.

3. How is the MSc course structured?

a. The course comprises 12 compulsory taught modules delivered during the first two terms (October to March) followed by a four and a half month individual project.
b. Students are given field training in the first term and are introduced to a wide range of hydrogeological practice through a seminar programme involving speakers from industry.

4. How is the taught course examined?

Written examinations take place in January (2 modules) and April (6 modules) covering the work of 8 of the 12 taught modules while coursework assignments are required to be completed for the remaining 4 modules.

5. How do I choose a project topic?

a. Each year in the spring a list of topic options is provided to the students from which they can make their choices. There are typically twice as many topics offered as there are students on the course and they vary significantly in scope, type of work and location. In all cases they are interesting and will provide an excellent chance to develop independent skills and experience.
b. Topics can be identified by students themselves. We ask only that students discuss their proposals with a member of staff and do not rush off to find their own topic with an industrial partner.
c. A large number of the topics are provided by industry and students can in many cases get a chance to work closely with the staff from the firms offering the topic.
d. Topics are provided in most years that are based overseas as well as in the UK. For example, in recent years some students have spent their summer projects in Brazil, Argentina, El Salvador, Sweden, France, Egypt, Canada, Ghana and South Africa.

6. When does the course start?

The course starts around the 1st of October each year. The time varies slightly from year to year depending on the University Calendar. Details of the 1st day in each year are provided at: http://www.about.bham.ac.uk/keydates/termdates.shtml

7. Can the course be taken part time?

Yes. The only requirement is that the students undertake the taught modules of the autumn term in Year 1 and the taught modules of the spring term in year 2. The project should be completed before the end of the second year but can be deferred to a third year if appropriate.

8. Is a distance learning option available?

No, the course is residential and at this stage is likely to remain so. We feel that this currently offers the best learning environment for all our students. It is important that you gain the maximum benefit from the course and this is presently best achieved through the residential course.

9. What facilities exist to support study?

The course is well endowed with facilities. The course has a dedicated teaching and study room with computers dedicated to MSc Hydrogeology students for email and web browsing. Good access is available: to the School and University computing facilities; to the chemical, fluid, and microbiological laboratories of the School of Geography Earth and Environmental Sciences; to field experimental sites on campus (including two borehole arrays); to a packed store containing field equipment for a wide range of hydrogeological investigations; as well as geophysical equipment.

10. Do you have any awards for international or non-UK students?

The course does not explicitly have any funding for overseas students, but the University's international office can provide details of possible scholarships to which students may apply depending on background and circumstances:

www.international.bham.ac.uk/scholarships.htm

11. Can you recommend where else I may find funding?

Some companies do have scholarship opportunities and the University also has a Scholarships Office that can provide identified opportunities for support:

www.as.bham.ac.uk/study/support/finance/pgstudents/index.shtml

12. Do you give letters of support that may assist me obtaining my own funds from industry, other grant schemes, or international government grants?

We will be happy to write letters of support for any student who wants to undertake the MSc and for whom we have given an offer of a place.

13. Should I expect to be interviewed?

We will not normally request you to come for interview. However, you are welcome to visit us and see at first-hand the environment in which you may spend the next year.

14. Can I come for an informal visit?

We welcome all students who wish to visit us. However, it is always appropriate to let us know in advance and to agree a day, date and time. In that way we will be able to ensure that we can meet you and discuss any matters that you may want to raise.

15. Who should I contact if I want to find out the status of my application or if I have questions on the application process?

Please contact either

Admissions Office:
Postgraduate Enquiries
Phone: 0121 414 5488
Fax: 0121 414 6378
Email: admissions@bham.ac.uk

or

the Admissions Tutor for the course:
Professor John Tellam– J.H.Tellam@bham.ac.uk;
+44 (0) 121 414 6138.

16. Who should I contact if I have technical or content questions on the MSc?

Please contact the Admissions Tutor for the course:
Professor John Tellam– J.H.Tellam@bham.ac.uk;
+44 (0) 121 414 6138.

Brandvlei Hot Spring, South Africa

17. How long does it take for a decision to be made on my application?

The aim is to respond to all applications within 6 weeks and earlier if possible. A decision on a place will be made when all information requested has been received.

18. If I am accepted on the course, do I need to do any pre-course preparation?

No. However, we would not stop any student from commencing background reading and we can provide in advance of the course a booklist that contains details of those books that we believe students on the course should purchase.

19. How do I go about finding accommodation in Birmingham?

You should receive details from the Admissions Office once you have unconditionally accepted a place on the course. The Accommodation Office will be able to provide information and you can seek additional information through the Student Guild on places in houses or flats near the University. We do offer to put students who have accepted to come on the course in touch with each other so that they can find shared accommodation in one of the many houses that are available to rent close to the University.

20. What are my chances of getting employment following the MSc Hydrogeology in the UK and abroad?

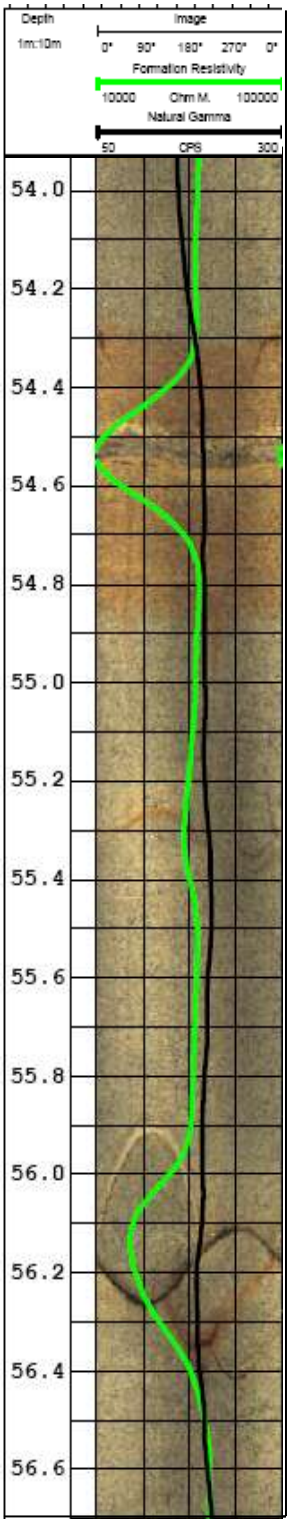
Excellent. Practically all students who have actively sought employment before completing the course have received a job offer and found employment before completion of the course. All students who want to work in hydrogeology have been successful in finding a good appointment. The number of job opportunities in Hydrogeology currently outnumbers the number of postgraduates.

21. Do you assist in finding hydrogeological employment?

We have a careers fair each year with up to 20 firms attending. Job opportunities are advertised on our careers notice board. Often companies contact us directly, and we maintain email circulation lists to pass on opportunity details to those students who have recently graduated (and even those that are looking to change jobs in their later careers).

22. If I want to work for a hydrogeological employer in the summer or year before I take the MSc course, can you provide contacts?

Yes, we can put you in touch with possible employers.



Photographs from Burkina Faso by Geòlegs del Món.