



The
University
Of
Sheffield.

Groundwater
Protection &
Research
Group.

Two Short Courses In Hydrogeology *And* Pollutant Fate And Transport.

Hydrogeology: 28 Sept- 1 October 2010
Fate and Transport: 9-11 November 2010
At the University of Sheffield

The Issues

Groundwater is a major part of the freshwater cycle, and is essential to water resources and the support of rivers and wetlands. It also underlies all contaminated land, providing the main pathway for pollution to travel offsite and affect human health and ecosystems. A good understanding of groundwater flow and pollution transport is essential to deal with contaminated land and groundwater pollution, as well as with freshwater resources and environmental issues. The unsaturated zone between the land surface and the water table is where many important reactions take place to attenuate pollutants.

Why you should do these courses!

This set of courses at MSc level covers the basic and practical aspects of groundwater flow and pollutant transport.

The HYDROGEOLOGY course is designed for those with little formal training in groundwater. It will be of particular interest for those dealing with contaminated land and groundwater. The course starts from the fundamentals of porosity and permeability, moves through groundwater flow patterns, and recharge estimation before dealing with investigation techniques. Case studies, exercises, workshops, reviews and presentations encourage students to be actively involved in their learning – the course is intensive but fun!

There is no short course like **FATE AND TRANSPORT OF POLLUTANTS IN GROUNDWATER**. It provides an overview of the nature of groundwater pollutants, their properties, and how plumes are created and evolve. Note that detailed environmental chemistry and biodegradation are not covered (we offer other courses on these). There will be discussion on the issues of urban groundwater, and sessions on the shallow aquifer systems that dominate most polluted sites. Case studies and exercises encourage students to actively engage with the topics, and understand how to design investigations at different scales and for different objectives. Delegates should either have attended the introductory module, or have a basic understanding of hydrogeology before taking this course.



Course outline: Hydrogeology

Tuesday 28 September (registration 9.30)

- Geology, rocks and aquifers
- Porosity and permeability

Wednesday 29 September

- Aquifer types
- Head, pressure and flow
- Flow patterns
- Topography, contours and flow

Thursday 30 October

- Hydrological cycle and water balances
- Recharge estimation
- Hydrogeological investigations
- Groundwater management (David Johnson)

Friday 1 October (finish 16.00)

- Storage properties
- Pumping tests
- Equations of flow and groundwater modelling

Course outline: Fate and Transport of Pollutants in Groundwater

Tuesday 9 November (registration 9.30)

- Hydrogeology revision
- Sources and properties of pollutants
- Pollution plumes in groundwater

Wednesday 10 November

- Drift and shallow aquifers (Jim Wragg)
- Basic and advanced solute transport

Thursday 11 November (finish 17.00)

- Urban hydrogeology
- Conceptual site models
- Pollution investigators (David Cragg)

Before you come

You are strongly recommended to read one of the introductory books on groundwater BEFORE starting the course, as we will pack a lot into each course! Try Younger, 2007, Groundwater in the Environment, Blackwell, or Price, 1996, Introducing Groundwater, Routledge, or the first few chapters of any hydrogeology textbook.

MSc Training in Contaminant Hydrogeology and the Environmental Management of Urban Land and Water

Our short courses all form part of our taught MSc programme. Each module is taught in a three week block, making intermittent study easy if you wish to take a degree part-time. So if you are thinking about doing more than one short course as continuing professional development, why not sign up for an MSc (12 modules and dissertation), Diploma (12 modules) or Certificate (6 modules)? These courses have been approved by the Institution of Civil Engineers for accreditation leading to Chartered Engineer status.

Our courses benefit from significant industry input, in both delivery of module content and development of collaborative projects for student dissertations. Course instructors include UK and international experts from academic and industry backgrounds. The courses have been designed to combine theoretical, technical and practical aspects to give you the best preparation for a rewarding career.

You can find further information on all our modules and MSc options on our website www.sheffield.ac.uk/civil/pg/ or you can contact Nicky Nash for MSc enquiries only on 0114 222 5711.

A. A. Hydrogeology
(28 Sept-1 Oct 2010)

B. Pollutant Fate and Transport
(9-11 Nov 2010)

Name

Job title

Organisation

Address

Telephone

Fax

Email

I would like a list of b&b accommodation

I would like more information on the Masters programme

I enclose a cheque made payable to the University of Sheffield (preferred option)

Courses A or B £750 per course

Both A & B £1350 (10% discount applied)

Continued overleaf

I would like to be invoiced at the above address

I would like to pay by credit card:

Number

Expiry date on card

Name on card

Signature on card

I have the following special requirements (eg vegetarian, mobility assistance)

Signed

Date

Fees and booking

The fee for the multi-day courses is £750, inclusive of course notes, lunches, and refreshments. A list of bed and breakfast accommodation in hotels or guesthouses can be provided if needed. Contact Pat Rayner with any enquiries about the short courses.

Please complete the booking form in the leaflet, and return to

Pat Rayner
The University of Sheffield
Department of Civil and Structural
Engineering
University of Sheffield
Mappin Street
Sheffield S1 3JD

Tel: 0114 222 5758

Fax: 0114 222 5793

E-mail: p.rayner@shef.ac.uk

You may be interested in our other courses:

Risk assessment 8-10 February 2011

Natural attenuation 31 May-2 June 2011

Catchment management June: date to be confirmed

Details on
www.shef.ac.uk/civil/shortcourses/

About the lecturers

Paul Hulme is a groundwater modeller with 19 years experience in both commercial consultancy and in the UK Environment Agency. He specialises in using environmental modelling methods to solve problems in the management of water resources, pollution control, mine dewatering and saline intrusion in the UK and overseas. He led the setting-up of the Environment Agency's national groundwater modelling programme and produced the Environment Agency's guidance documents on groundwater resources modelling. Paul is currently chair of the UK Groundwater Modellers' Forum and is director of the consultants pjHYDRO based in the UK.

Zuansi Cai is a postdoctoral researcher within the GPRG at Sheffield. Trained in China and Denmark, his PhD was in Sheffield on developing reactive transport modelling techniques for dual porosity systems, studying the idea of zero-valent iron Fracture Reactive Barriers (FeO-FRB). Currently he is part of the SABRE (Source Area Bio-REmediation of Chlorinated Solvents) consortium, where he leads the work on performance assessment of a groundwater restoration experiment using a range of statistical and modelling techniques.

David Cragg is an Associate leading the Geo-Environment team in Scott Wilson's Ground Engineering consultancy. He is a chartered engineer and chartered geologist with 25 years experience, specialising in the investigation and reclamation of brownfield land. He is also a Specialist in Land Condition. After graduating with a BSc in Physical Geography & Geology, David obtained a MSc in engineering geology from Leeds University and a MSc in Contaminated Land Management from Nottingham Trent University. He worked for site investigation contractors in the UK and the United Arab Emirates, before joining Scott Wilson. His current work focuses upon investigations, risk assessments and remediation designs for landowners, vendors, purchasers and reclamation contractors concerned with brownfield land reclamation and development.

David Johnson is an engineer and groundwater manager with extensive experience in using groundwater modelling to help solve water resources and water quality issues. He worked for the Environment Agency for 10 years where he led the water team and was responsible for work on the designation of nitrate vulnerable zones, the assessment of groundwater dependent ecosystems (wetlands), recharge estimates, ground source heat pumps and reviewing the Agency's groundwater monitoring network. David has recently joined ADAS where he leads their groundwater team in Wolverhampton.

Jim Wragg is a director of Ford Consulting Group. He is a hydrogeologist with 18 years experience in the assessment and remediation of contaminated land. He has a BSc in Geology from Cardiff and an MSC in Hydrogeology from Birmingham. Since 1989 he has specialised in the design and implementation of risk based corrective action programmes for soil and groundwater contamination issues at both active and redundant industrial facilities. These have included dealing with a broad spectrum of contaminant types in a wide range of hydrogeological settings. He has applied a detailed understanding of both aspects to design and implement civil, process and biologically based remedial systems appropriate to the issues at hand.
