CODES AND GHD PRESENT A SHORT COURSE ON:

Geophysics for Geologists and Engineers

A practical course in applied geophysics specifically designed to provide geoscientists and engineers with a good understanding of the diverse applications of geophysical methods for exploration, mining, geotechnical and environmental projects.

**DATE:** 10 to 15 February, 2014  
**VENUE:** CODES, University of Tasmania (UTAS)

**WHO SHOULD ATTEND:** Exploration geologists, mine geologists, mining engineers, geotechnical engineers, civil engineers, environmental engineers and other industry professionals who need an up-to-date overview of modern geophysical investigation methods.

**COURSE SYNOPSIS**

This intensive six-day program offers geologists and engineers a modern overview of the application of geophysical methods to geological exploration, mining issues, geotechnical investigations and environmental assessments. It is designed to provide professional geoscientists and engineers with the necessary background understanding to utilise a wide variety of geophysical methods, together with important practical skills in technique selection, survey planning, data acquisition and interpretation.

The course is designed and presented by two leaders in their fields: CODES and GHD Pty Ltd. Based at UTAS, CODES is the Australian Research Council Centre of Excellence in Ore Deposits. This internationally renowned Centre is recognised as a world leader in ore deposit research, with a track record for excellence in its postgraduate training. GHD was established in 1928 and is one of the world’s leading engineering, architectural and environmental consulting companies, with more than 6,500 employees across five continents. The combination of these two highly credentialed groups provides an exceptional mix of complementary skills that ensure a high quality program.

The important theoretical background for each geophysical technique will be covered with a minimum of mathematical formalism. The focus will be on practical application of geophysical methods to solve geological or geotechnical problems. The course integrates formal presentations on geophysical theory, data processing and data analysis with numerous practical sessions including data acquisition exercises, interpretation projects, and geophysical equipment demonstrations.

Applied geophysical investigations can be undertaken at any scale and the basic physical principles, survey procedures and data analysis methods are not dependent on the size of the study area. This course will expose participants to a diverse collection of geophysical datasets and exercises ranging from regional-scale greenfields exploration to small-scale geotechnical and environmental projects.
THE PROGRAM

The teaching pattern on each day of the course will typically involve classroom presentations, data acquisition activities in the UTAS grounds, computer analysis and modelling exercises, and geophysical equipment demonstrations. Activities will commence at 8.30am each day and typically conclude at 5.30pm.

DAYS 1 AND 2 MONDAY FEBRUARY 10 AND TUESDAY FEBRUARY 11

Gravity and Magnetic Methods

- Basic gravity theory
- Gravity survey methods, instrumentation and field procedures
- Surveying for geophysical surveys
- Gravity data processing
- Basic magnetic theory
- Rock magnetisation
- Magnetic survey methods, instrumentation and field procedures
- Processing and enhancement of potential field data
- Qualitative interpretation of geophysical imagery
- Quantitative interpretation of potential field data – forward modelling and inversion

DAYS 3 AND 4 WEDNESDAY FEBRUARY 12 AND THURSDAY FEBRUARY 13

Electrical, Electromagnetic and Borehole Methods

- The electrical properties of rocks
- Spontaneous potential
- Galvanic methods – resistivity and IP theory, field procedures and logistics
- Resistivity and IP data processing and interpretation
- The EM method – basic EM theory, FEM, TEM, AEM, field procedures and logistics
- Magnetometric resistivity
- Downhole electrical methods DHEM, DHMMR
- EM data processing, display and interpretation
- Ground penetrating radar
- Borehole logging methods – basic theory – selection of tools etc.

DAYS 5 AND 6 FRIDAY FEBRUARY 14 AND SATURDAY FEBRUARY 15

Seismic Methods

- Seismic wave propagation, wave types, elastic properties and seismic velocity
- Seismic sources and detectors
- Seismic refraction – theory and field procedures
- Seismic refraction – data interpretation
- Surface wave methods – theory and data interpretation
- Seismic reflection – theory and field procedures
- Seismic reflection – data processing
- Seismic reflection – data interpretation

COURSE VENUE AND FACILITIES

All classroom activities will be conducted at CODES / School of Earth Sciences, UTAS.

Data processing and interpretation exercises will be undertaken in computer laboratories that are equipped with an extensive collection of commercial and publicly available geophysical software. Students are encouraged to bring their own laptops and will be provided with a DVD containing public domain geophysical data analysis and display software, some of which will be used during the course.

UTAS has a comprehensive range of geophysical equipment that will be utilised by participants for data acquisition exercises and for equipment demonstrations:

- Digital and analogue gravity meters
- Geodetic-grade DGPS instruments
- Overhauser magnetometers
- Resistivity and induced polarisation systems
- Frequency domain electromagnetic systems
- Time domain electromagnetic systems
- Ground penetrating radar
- Down-hole logging systems
- Seismic data acquisition systems

THE PRESENTERS

Michael Roach is a Senior Lecturer in geophysics at UTAS. Michael worked in the coal industry as a geologist and geophysicist for 9 years before completing a PhD focussing on quantitative interpretation of regional potential field geophysical data. He has over 20 years’ experience teaching undergraduate and postgraduate geophysics, engineering geology and mining geology courses and has supervised student projects in a diverse range of geophysical disciplines.

Hugh Tassell is a Principal Geophysicist with GHD in Hobart. Hugh has a broad geophysical background having worked on crustal geophysics projects, mineral exploration, oil exploration, geotechnical, infrastructure development and environmental studies. He has extensive experience in the application of innovative geophysical methods to characterise the properties of the near-surface environment.
GEOPHYSICS FOR GEOLOGISTS AND ENGINEERS
10–15 FEBRUARY 2014

REGISTRATION FORM
Please note there is a limit of 20 participants for this course, so please return the form as soon as possible. Registrations close January 31, 2014.

PERSONAL DETAILS
Title – Please circle ( Prof / Dr / Mr / Mrs / Ms / Miss )
First Name __________________________ Last Name (surname/family name) __________________________
Preferred Name (for name tag) __________________________
Position __________________________ Company/University __________________________
Address __________________________
City __________________________ State __________ Postcode __________
Country __________________________
Email __________________________ Mobile __________________________
Phone (home) __________________________ Phone (work) __________________________ Fax __________________________
Dietary requirements/allergies __________________________

REGISTRATION FEE
The fee is $3,500 (including GST) and includes catering and one course dinner. Participants are required to make their own travel and accommodation arrangements. Please keep a copy of this form for your records and email, post or fax the original to:

Dr Michael Roach
CODES, University of Tasmania, Private Bag 126
Hobart, Tasmania, Australia 7001
Email: Michael.Roach@utas.edu.au
Phone: +61 3 6226 2474 Fax: +61 3 6226 7662

PAYMENTS
Full payment must be received prior to 31 January, 2014.
AMOUNT DUE: AU$3,500
Payment options (please tick boxes, where appropriate)
☐ Credit Card
Upon receipt of your registration form you will be provided with a payment reference number and web address for on-line payments. Please note: Credit card details cannot be accepted by email.

☐ Cheque or Bank Draft
Please make cheques and bank drafts payable to “The University of Tasmania”. Bank drafts must be made out in Australian currency.

☐ Purchase Order (option for UTAS participants only)
UTAS Account Number __________________________

Invoice
Invoices can be issued on request. Please specify name and address to whom the invoice is to be raised (or email this information to Michael.Roach@utas.edu.au).