CODES presents a short course on

Ore Deposit Geochemistry, Hydrology and Geochronology

June 3 – 14, 2019

An up-to-date review of the theory and practice of geochemistry, hydrology and geochronology as applied to studies of ore deposit genesis and in mineral exploration. The first week covers basic principles of ore fluid chemistry, fluid-rock interaction, lithogeochemistry, and the physical hydrology of fracture-controlled hydrothermal systems. Other topics include granite geochemistry and metallogeny, advanced geochemical exploration and geochronology. The second week covers next-generation geochemical exploration techniques, including stable isotope geochemistry, the use of pyrite in mineral exploration (using samples provided by short course participants), controls on magma composition and fertility in magmatic arcs, and mineral chemistry vectoring in porphyry and epithermal environments.

WHO SHOULD ATTEND: Ore deposit researchers, industry professionals and exploration geologists requiring an up-to-date overview of ore forming systems and how this knowledge can enhance mineral exploration.

This short course is offered as part of the national Minerals Geoscience Masters (MGM) program. Industry participants and other students are also encouraged to attend.
Participants must provide a small pyritic rock sample for study during the short course. The trace element composition of pyrite in the sample will be mapped by LA-ICPMS prior to the course. Participants use the data to make predictions about deposit type, proximity and fluid chemistry based on the observed patterns of trace element enrichment.

Pyritic samples from any deposit type will do, but general guidelines are:

- Pyrite formed below ~350°C is generally most informative. Pyrite from deposits with protracted mineralization histories is ideal.
- Pyrite from porphyry Cu and other higher temperature deposits (or highly metamorphosed deposits) contains fewer trace elements and is less suitable for this exercise. If used, choose samples from the fringes of porphyry deposits.
- Diagenetic pyrite may also have elevated trace element contents, although in most cases these will not be ore-related.
- Ideally, samples should be between 30 and 300 g, and contain pyrite grains 0.05 – 2 mm in size. Please avoid samples containing coarse grained or abundant arsenopyrite.
- Samples should be delivered at least four of which must be undertaken at CODES. Duration: 18-24 months full-time; up to 30 months part-time (flexible in recognition of industry participants). Option 2: completion of a two unit research thesis and six units of course work (four of which must be undertaken at CODES; the remaining two may be completed at CODES, UWA or Curtin). Duration: 18-24 months full-time; up to 30 months part-time (flexible in recognition of industry participants).

Option 2: Completion of eight course work units, at least four of which must be undertaken at CODES. Duration: up to 30 months part-time (flexible in recognition of industry participants).

Course content

This coursework-based Masters program is aimed at geoscientists seeking a thorough up-date on advances across the spectrum of economic geology applied to ore deposits and mineral exploration. The Master of Economic Geology at UTAS is part of the national Minerals Geoscience Masters program offered by the University of Tasmania and the University of Western Australia in conjunction with the Business School at Curtin University.

Course structure

The Masters course can be completed in either of two ways:

- Units offered by CODES
  - Ores in magmatic arcs – Indonesia (KEA707): 11 – 26 March, 2019
  - Ore deposit geochemistry, hydrology and geochronology (KEA709/KEA704): 3 – 14 Jun, 2019
  - Ores in magmatic arcs – South America (KEA707): 11 – 26 October, 2019
  - Geometallurgy (KEA711): 4 Oct – 15 Nov, 2019
  - Volcanology and mineralisation in volcanic terrains (KEA708/KEA703): next offered Mar 2020
  - Exploration in brownfield terrains (KEA710/KEA705): next offered Jun 2020
  - Ore deposit models and exploration strategies (KEA712): next offered Oct 2020

- Exploration in brownfield terrains (KEA710/KEA705): next offered Jun 2020
- Ore deposit models and exploration strategies (KEA712): next offered Oct 2020

Fees

In 2019, the UTAS tuition fee is $2339 per unit (8 in total) for domestic students and $7988 (AUD) per unit for full-fee paying overseas students (FFPOS). Field-based courses have additional costs. Fees vary at other MGM partner institutions. International students should refer to http://www.international.utas.edu.au/ or contact the Masters Coordinator for more information (see page 4 for contact details).
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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Presenter(s)</th>
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<tbody>
<tr>
<td>Monday 3 June</td>
<td>Introduction to the chemistry of hydrothermal fluids (basic principals of hydrothermal geochemistry, hydrothermal fluid sources, metal transport and deposition)</td>
<td>David Cooke</td>
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<td>Tuesday 4 June</td>
<td>Hydrology, fluid-rock interaction and breccia development in hydrothermal/magmatic-hydrothermal systems</td>
<td>Nick Oliver, Robert Scott</td>
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<td>Wednesday 5 June</td>
<td>Physical hydrology of fracture-controlled hydrothermal systems</td>
<td>Nick Oliver, Lesley Wyborn</td>
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<td>Thursday 6 June</td>
<td>Granites and granite metallogeny (continued)</td>
<td>Phil Blevin, Lesley Wyborn</td>
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<td>Friday 7 June</td>
<td>Enhanced geochemical exploration</td>
<td>Scott Halley</td>
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<td>Saturday 8 June</td>
<td>Geochronology of magmatic-hydrothermal systems</td>
<td>Sebastien Meffre, Ron Berry, Paul Olin</td>
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<td>Sunday 9 June</td>
<td>Private study</td>
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<tr>
<td>Monday 10 June</td>
<td>Application of pyrite trace element chemistry to studies of ore deposit genesis and mineral exploration</td>
<td>Robert Scott, Leonid Danyushevsky, Jeff Steadman</td>
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<td>Tuesday 11 June</td>
<td>Mineral chemistry vectoring in porphyry and epithermal environments</td>
<td>Mike Baker, Lejun Zhang</td>
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<td>Wednesday 12 June</td>
<td>Stable isotopes</td>
<td>Shaun Barker</td>
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<tr>
<td>Thursday 13 June</td>
<td>Metal transport in brines and petroleum</td>
<td>Poul Emsbo</td>
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<td>Friday 14 June</td>
<td>Fluid inclusions</td>
<td>David Cooke, Steve Cox, Robert Scott, Poul Emsbo</td>
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<td>MGM student presentations and wrap-up</td>
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**REGISTRATION FORM**

**PERSONAL DETAILS**

Title – please circle (Prof / Dr / Mr / Mrs / Ms / Miss)

First name .............................................. Last Name (Family name) .................................................................

Preferred name (for name tag) .............................................. Position .................................................................

Company / affiliation ..........................................................................................................................................

Address ...............................................................................................................................................................

City .............................................. State ...................... Country .............................................. Postcode / ZIP ............... 

Email .................................................................................................................................................................

Phone (home) .............................................. Phone (work) .................................................. Fax ..............................

Dietary requirements / allergies ........................................................................................................................


**REGISTRATION FEES**

Fees are in Australian dollars and include 10% GST. Please tick box.

- Minerals Geoscience Masters students
  - Tuition fee only
  - Course dinner – Saturday 8 June ($66)

- Industry participant
  - Full course ($3,960)
  - ….. days at $660/day
  - Course dinner – Saturday 8 June ($66)

- CODES staff / students
  - Free (indicate days below)
  - Course dinner – Saturday 8 June ($66)

- Other students
  - Full course ($660)
  - Course dinner – Saturday 8 June ($66)

- PLEASE NOTE:
  Participants **NOT** attending entire course, please circle selected days

  Week 1:  3  4  5  6  7  8 June
  Week 2:  10  11  12  13  14 June

**PAYMENTS**

Registrations (with full payment) must be received before June 1, 2019. Non-MGM students must provide proof of student status to obtain student discount.

TOTAL AMOUNT DUE: $ ................................................................................

Payment options (please tick box)

- Credit card (VISA/Mastercard only)
  Payment reference number and web address for on-line payments will be issued upon receipt of your registration form.

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

- Purchase Order
  UTAS Account Number ..............................................................................................

- Invoice
  Please provide name and address of person/company to whom invoice should be sent. If same as above write “as above”.

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**PLEASE NOTE:**

MGM STUDENTS: THIS FORM DOES NOT CONSTITUTE AN OFFICIAL UNIVERSITY ENROLMENT – YOU MUST ALSO ENROL THROUGH YOUR HOME INSTITUTION