



MASTER OF ECONOMIC GEOLOGY UNIT

Ores in Magmatic Arcs - South America

25 October – 11 November 2023



CODES, Centre for Ore Deposit and Earth Sciences, University of Tasmania

CRICOS Provider Code 00586B

The Andean margin of South America contains several of the world's major mineral provinces. The magmatic arcs of the Andes are the source of most of the world's copper and molybdenum from porphyry-style deposits. They are also major sources of gold and silver, primarily from epithermal deposits. Other deposit styles developed through the Andes include IOCGs, skarns, VHMS and orogenic gold deposits. As this region is one of the major areas globally for mineral exploration and mining, there is a pressing need for relevant training on research and exploration skills applicable to ores formed in these magmatic arc environments, focussing on the specific geological, tectonic and environmental characteristics of this region. CODES is therefore proud to offer our two-week field-based unit, Ores in Magmatic Arcs – South America.

This unit has a strong focus on field observations and hands-on practical skills, supported by an understanding of theoretical aspects. The full spectrum of deposits (e.g., porphyry, high sulfidation, low sulfidation) developed in magmatic arc settings will be covered. The unit presenters have detailed knowledge of the areas and deposits visited and are uniquely equipped to deliver the skills and insights needed by participants.

Registration fees include all accommodation and field transport, course notes, field guide, and breakfasts and lunches. Travel to and from South America, and all internal flights within South America, dinners and alcohol, are not included in the fee and are the responsibility of each participant. A valid passport is required for entry into Chile and Peru, and it is the responsibility of each participant to determine whether they require a visa for each country visited, and to obtain that visa before travel.

UNIT PRESENTERS

David Cooke is Professor of Geochemistry, and Director of CODES. He has extensive research expertise in hydrothermal fluid chemistry and ore-forming systems, specialising in porphyry and epithermal deposits.

Yamila Cajal is a Research Fellow in Critical Minerals Characterisation at CODES. She has research and industry experience in magmatic-hydrothermal deposits, especially in magma fertility related to porphyry copper deposits.

Jaime Osorio is a Senior geologist with over 15 years of experience in the exploration of porphyry and epithermal deposits in the Andes. He has an MSc from Oregon State University, and is currently undertaking a PhD at CODES.

Victor Torres is a Senior exploration geologist at Chakana Copper Corporation, with experience in copper, gold, silver, and gem exploration, from early prospects to advanced exploration projects in South America and Madagascar. He has an Engineering degree, a Master of Economic Geology, and is currently undertaking a PhD at CODES.

Jose Piquer is Associate Professor at Universidad Austral de Chile, and Director of the Institute of Earth Sciences. He has over 18 years of research and industry experience in economic geology, including a PhD at CODES and 8 years working in mineral exploration. His research is focused on understanding the structural controls on

magmatic-hydrothermal systems at various scales, and the use of whole-rock and mineral chemistry to detect fertility signals and develop vectoring tools.

TRAVEL AND CLOTHING

All participants must carry their own PPE (steel-capped boots, long-sleeved shirts, long sturdy trousers, hard hats, reflective vests, safety glasses, gloves and hearing protection). You will need sun cream, lip balm and moisturisers (particularly in Chile), and cold and wet weather gear.

All participants are required to have a medical assessment for fitness to work at high altitude prior to the trip. Several days of the trip will be at locations in excess of 3,500m in elevation.

REGISTRATION FEE INCLUSIONS

- Accommodation October 24th—November 10th inclusive (most student accommodation will be shared)
- Ground transport
- Course notes and field guide
- Breakfasts, lunches and some group dinners

EXCLUSIONS

- Travel to and from South America (e.g. international flights, accommodation in transit, visa fees etc.)
- Flights within and between Chile and Peru
- Most dinners
- Alcohol

PARTICIPATION via KEA724

The field excursion is also available for any students enrolled in KEA724 who previously completed KEA707 (Indonesia). Please contact the unit coordinator of KEA724 (Dr Robert Scott) to confirm that you can participate in the field excursion as a KEA724 student and to discuss the assessment requirements for the unit.



Ores in Magmatic Arcs
is offered as a unit in the national Minerals Geoscience Masters program.

MASTER OF ECONOMIC GEOLOGY

THE MOST COMPREHENSIVE MASTER DEGREE IN MINERAL EXPLORATION AND MINING GEOLOGY ANYWHERE IN THE WORLD

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

Course structure

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

Option 1 (research pathway): requires the completion of six coursework units (worth 75% of total credit points) and a minor research thesis (worth 25%). Five of the units must be completed at CODES including thesis units KEA724 and KEA725, core units KEA712, KEA716 and at least one field-based unit, while the remainder may be completed at other participating universities. Duration: 18–24 months full-time; up to 36 months part-time (flexible in recognition of industry participants).

Option 2 (professional pathway): requires the completion of eight units of coursework, at least five of which must be undertaken at CODES including core units KEA712, KEA716 and at least one field-based unit. Duration: up to 36 months part-time (flexible in recognition of constraints on industry participants).

Participating universities offer up to seven units annually or in rotation over a two-year period. Most units are of two weeks duration.

Fees

UTAS tuition fees are approximately \$2,075 per unit (8 in total) for domestic students (2023 rate for Commonwealth Supported Places) and \$9,238 (AUD) per unit for full-fee paying overseas students (FFPOS) (2023 rate). Field-based courses have additional costs. Costs will vary for units taught by other MGM partner institutions.

Entry Requirements

BSc (Hons), or a BSc (majoring in geoscience) with at least two years industry experience. International students should be aware that English language proficiency requirements also apply.

Masters units offered by CODES

- 29 May – 3 June & 3 – 7 July 2023:
KEA709 Ore Deposit Geochemistry, Hydrology and Geochronology #
- 7 August – 15 October 2023 (Intensive Part 2: 18 – 22 September):
KEA713 Geodata Analytics *
- 16 – 27 October 2023:
KEA711 Geometallurgy ^
- 25 October – 11 November 2023:
KEA707 Ores in Magmatic Arcs (South America) ^
- February 2024:
KEA718 Advanced Field Skills in Economic Geology ^
- March 2024:
KEA708 Volcanology and Mineralisation in Volcanic Terrains (New Zealand, western Tasmania) ^
- April – May 2024:
KEA716 Fundamentals of Economic Geology *
- June – July 2024:
KEA712 Ore Deposit Models and Exploration Strategies #
- August – October 2024:
KEA713 Geodata Analytics *
- October – November 2024:
KEA710 Exploration in Brownfield Terrains *

NB COVID-19 travel restrictions may impact the running of units with face to face delivery

* online delivery

blended delivery (week 1 face to face/online; week 2 online)

^ face to face delivery

For further information contact:

Dr Robert Scott
Masters Coordinator, CODES
Private Bag 79, Hobart 7001, Australia
Tel: +61 3 6226 2786
Email: CODES.Info@utas.edu.au
Robert.Scott@utas.edu.au
Website: utas.edu.au/codes/masters-short-courses

PRELIMINARY PROGRAM

LEADERS: DAVID COOKE, YAMILA CAJAL, JAIME OSORIO, VICTOR TORRES

Tuesday October 24	Arrive in Santiago, Chile	Las Condes
Wednesday October 25	Rio Blanco—Los Bronces	Las Condes
Thursday October 26	El Teniente*	Las Condes
Friday October 27	Rio Maipo transect	Las Condes
Saturday October 28	AM: Fly to La Serena; drive to Vallenar PM: Valeriano core	Vallenar
Sunday October 29	Productora and Cortadera; drive to Copiapo	Copiapo
Monday October 30	AM: Candelaria PM: Solares Norte	Bahia Inglesa, Caldera
Tuesday October 31	AM: Manto Verde PM: Santo Domingo	Bahia Inglesa, Caldera
Wednesday November 1	AM: Student presentations PM: Fly to Santiago	Santiago Airport Hotel
Thursday November 2	Fly to Lima, medical exam; drive to Chinca	Chinca
Friday November 3	Early start to Cerro Lindo (5:30am); drive to Miraflores	Miraflores, Lima
Saturday November 4	Soledad drill core	Lima Airport
Sunday November 5	Fly to Cajamarca (5:30am) Antakori core review	Cajamarca
Monday November 6	Tantahuatay and La Zanja drill core	Cajamarca
Tuesday November 7	AM: Fly to Lima; drive to Rio Seco PM: El Seco coreshed; drive to Churin	Churin
Wednesday November 8	AM: Drive to Uchucchacua; Uchucchacua PM: Yumpag mine; drive to Cerro de Pasco	Cerro de Pasco
Thursday November 9	Atacocha and El Porvenir	Cerro de Pasco
Friday November 10	Drive to Colquijirca; Colquijirca; drive to Lima	Lima Airport
Saturday November 11	End of trip	

**NB El Teniente site visits are age restricted to <65 years*



REGISTRATION FORM

Ores in Magmatic Arcs

25 October – 11 November 2023

Please complete and return to:

CODES

University of Tasmania, Private Bag 79

Hobart, Tasmania, Australia 7001

Ph: +61 3 6226 2472

Email: CODES.Info@utas.edu.au

PERSONAL DETAILS

Title—Please highlight (Prof / Dr / Mr / Mrs / Ms / Miss)

First Name: Last Name: (surname / family name):

Preferred Name (for use on name tag):

Position:

Company / University:

Address:

City: State: Postcode: Country:

Email: Phone (mobile / cell):

Dietary requirements / allergies / other health issues:

Emergency contact (name and email/phone contact):

Passport (Nationality/number/expiry):

REGISTRATION FEES

All fees are in Australia dollars (AUD). Fees do not include tuition costs for enrolled students or airfares.

Please indicate

MGM Masters Students:

Total field fee \$6,000*

Deposit (GST free): \$2,000

Balance (GST free): \$4,000

Industry Participants:

Total registration fee \$14,000

Deposit (GST free): \$6,000^

Balance (GST free): \$8,000

Other Students:

Total registration fee \$6,000*

Deposit (GST free): \$2,000

Balance (GST free): \$4,000

*this price is the maximum field fee cost and may be reduced for students pending finalisation of ground transportation and accommodation costs.

^non-refundable for cancellation

PAYMENT

Registrations and deposit payments are due by 8th of September, 2023. Full payment must be received by 6th of October, 2023.

Preferred payment method. Please indicate

Credit Card

Upon receipt of your registration form and confirmation of your place, you will be provided with a payment reference number and web address for online payments. Please note: Credit card details cannot be accepted by email.

Invoice (payment can be made by credit card or bank transfer)

Invoice to (name/company):

Attention to (optional):

Reference (e.g. order number (optional)):

Address:

Email address:

#NB due to the high level of interest in this field-based unit, and the limit on group size, places are not secured until deposit payments have been received.

Please retain a copy of this form from your records and email or post original to CODES (contact details above).

MGM STUDENTS: THIS FORM DOES NOT CONSTITUTE AN OFFICIAL UNIVERSITY ENROLMENT—YOU MUST ALSO ENROL VIA ESTUDENT AND ENSURE TUITION FEES ARE PAID BY THE PAYMENT DEADLINE (OCT 24).