

GEOL 5806 - Modular Graduate Course in Exploration Geochemistry

Mineral Exploration Research Centre, Harquail School of Earth Sciences, and Goodman School of Mines

All Lectures and Labs will be delivered on-campus in the Executive Learning Centre and live via Zoom

DAY	START	END	TOPIC	SPEAKER
0 Thu 08 Dec 2022 Optional ioGAS Tutorial	0900	1030	Introduction to ioGAS	Michael Leshner (HES/MERC)
	1030	1100	Break	
	1100	1200	Working with ioGAS	Michael Leshner (HES/MERC)
	1200	1300	Break	
	1300	1430	Practical Exercise: Analysis of a Silicate Litho geochemistry Database	Michael Leshner (HES/MERC)
	1430	1500	Break	
	1500	1700	Practical Exercise: Analysis of a Sulfide Geochemistry Database	Michael Leshner (HES/MERC)
1 Fri 09 Dec 2022	0900	1030	Analytical methods	Marcus Burnham (Geo Labs)
	1030	1100	Break	
	1100	1230	Analytical methods	Marcus Burnham (Geo Labs)
	1230	1330	Break	
	1330	1430	QCQA (Standards, Reference Materials, Precision/Accuracy, Failure Monitoring)	Jennifer Hargreaves (Geo Labs)
	1430	1500	Break	
	1500	1700	Lab 1 - QAQC	Burnham and Hargreaves (Geo Labs)
2 Sat 10 Dec 2022	0900	0930	Data preparation	Michael Leshner (HES/MERC)
	0930	1030	Preliminary considerations in data analysis, litho geochem data, censored data, data transformations	Cliff Stanley (Acadia)
	1030	1100	Break	
	1100	1230	Sampling & geostatistics, sampling theory, geostatistical overview	Cliff Stanley (Acadia)
	1230	1330	Break	
	1330	1500	Major/trace element geochem, basic litho geochem, conserved element diagrams, discriminating lithologies, classification, strategy for analysis	Cliff Stanley (Acadia)
	1500	1530	Break	
	1530	1700	Lab 2 - Litho geochemistry	Cliff Stanley (Acadia)
3 Sun 11 Dec 2022	0900	1030	Molar element ratio analysis theory 1, closure, theorem of geochemical material transfer, diagrams and projective geometry	Cliff Stanley (Acadia)
	1030	1100	Break	
	1100	1230	Molar element ratio analysis theory 2, calculations, testing cogenetic hypotheses, PER & GER diagrams and examples	Cliff Stanley (Acadia)
	1230	1330	Break	
	1330	1500	Molar element ratio analysis theory 3, hydrothermal alteration, custom norms	Cliff Stanley (Acadia)
	1500	1530	Break	
	1530	1700	Lab 3 - Pearce element ratio analysis and general element ratio analysis	Cliff Stanley (Acadia)
4 Mon 12 Dec 2022	0900	1030	Alteration mass balance	Michael Leshner (HES/MERC)
	1030	1100	Break	
	1100	1230	Lab 4 - Alteration mass balance	Michael Leshner (HES/MERC)
	1230	1330	Break	
	1330	1500	Stable isotopes	Matt Leybourne (QU)
	1500	1530	Break	
	1530	1700	Lab 5 - Stable isotopes	Michael Leshner (HES/MERC)
5 Tue 13 Dec 2022	0900	1030	Radiogenic isotopes	Matt Leybourne (QU)
	1030	1100	Break	
	1100	1230	Lab 6 - Radiogenic isotopes	Michael Leshner (HES/MERC)
	1230	1330	Break	
	1330	1500	Till geochemistry & indicator minerals	Matt Leybourne (QU)
	1500	1530	Break	
	1530	1700	Transport through cover	Matt Leybourne (Queen's)
6 Wed 14 Dec 2022	0900	1030	Stream sediments and lake sediments	Matt Leybourne (Queen's)
	1030	1100	Break	
	1100	1230	Aqueous geochemistry	James Kidder (GSC)
	1230	1330	Break	
	1330	1500	Aqueous isotope geochemistry	James Kidder (GSC)
	1500	1530	Break	
	1530	1700	Lab 7 - Surficial geochemistry	Matt Leybourne and Beth McClenaghan
7 Thu 15 Dec 2022	0900	1030	Primary (igneous) and secondary (alteration) litho geochemistry in VMS exploration	Steve Piercey (Memorial)
	1030	1100	Break	
	1100	1230	Hydrothermal sediment geochemistry/isotopes	Steve Piercey (Memorial)
	1230	1330	Break	
	1330	1500	New developments and future trends in VMS litho geochemistry/mineral chemi	Steve Piercey (Memorial)
	1500	1530	Break	
	1530	1700	Mineral exploration VMS and Au case studies	Behnam Sadeghi (Carnegie Inst Sci)
8 Fri 16 Dec 2022	0900	1030	Case study: Exploration geochemistry of unconformity U deposits	Steve Beyer (Queen's)
	1030	1100	Break	
	1100	1230	Lab 8 - Uranium	Steve Beyer (Queen's)
	1230	1330	Break	
	1330	1530	Case study: Exploration geochemistry of porphyry Cu deposits	Robert Lee (MDRU/UBC)
	1530	1600	Break	
	1600	1700	Lab 9 - Porphyry Cu deposits	Robert Lee (MDRU/UBC)
9 Sat 17 Dec 2022	0900	1030	Case study: Exploration geochemistry of orogenic Au deposits	Stephane Perroudy (HES/MERC)
	1030	1100	Break	
	1100	1230	Lab 10 - Orogenic Au deposits	Stephane Perroudy (HES/MERC)
	1230	1330	Break	
	1330	1500	Case study: Machine learning	John McGaughey (MIRA)
	1500	1530	Break	
	1530	1700	Machine learning demo	John McGaughey (MIRA)
10 Sun 18 Dec 2022	0900	1030	Diamond exploration geochemistry	Dave Crabtree (Geo Labs)
	1030	1100	Break	
	1100	1230	Fractal and multifractal modeling and the relevant uncertainty analysis	Behnam Sadeghi (Carnegie Inst Sci)