DALHOUSIE UNIVERSITY

Faculty of Science Course Syllabus

Department of *Earth Sciences*

ERTH 4151 / ERTH 5151

Mineral Deposits

Winter 2018-2019

Instructor(s): *Yana Fedortchouk (lectures)* *yana@dal.ca* *LSC 3050*

Luke Hilchie (labs) *lhilchie@dal.ca* *TBA*

Lectures: *M, W 9:05 – 10:25* *MCCAIN ARTS&SS 2190*

Laboratories: *12 lab sessions (2.5 hours) include presentations and lab exam*

Tutorials: *NA*

Course Description

This course is an introduction to the geology of metallic ore and some industrial mineral deposits. Emphasis is given to the ore formation processes that lead to the economic concentrations of commodities. The course integrates many Earth Science disciplines. Laboratory work introduces ore study in reflected light microscopy.

Course Prerequisites

ERTH 3010.03, 3140.03

Course Objectives/Learning Outcomes

- *Understand principles of evaluation and classification of mineral deposits and ore-forming processes.*
- *Evaluate the geological, economical, geographical and other factors affecting the prospectively of a deposit, recognize stages of exploration and mining*
- *Ore formation and mechanism of concentration, stratigraphic and structural control of mineral deposits and their metallogeny.*
- *Identify ore minerals and interpret ore textures and alteration assemblages in hand samples and under a microscope in reflected and transmitted light*
- *The application of isotopes, trace elements, and thermobarometery to understanding ore forming processes.*
- *Link the formation of ore deposits to large-scale geologic and tectonic processes; recognition and evaluation of metalogenic provinces and epochs.*

Course Materials

There is no required textbook(s)

- *A highly recommended textbook: John Ridley "Ore Deposit Geology" 2013 Cambridge University Press*
- *Lecture material will also use L. Robb "Introduction to Ore-Forming Processes", Wiley, 2009.*

Additional materials include:

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- *Ore Deposit Models vol. 1 and vol. 2, 1988 and 1993, Geological Association of Canada to use for in-class presentations (available to borrow from the Department's office)*
- *Ore Mineral Atlas by Marshall, Anglin and Mumin, 2004, Geological Association of Canada to use during lab sessions (will be provided during the labs)*
- *Course website on Brightspace*

Course Assessment

Component	Weight (% of final grade)		Date
Tests/quizzes			
Midterm	*20%*	*15% (ERTH 5151)*	*February 13*
Lab exam	*10%*		*TBA*
Final exam	*20%*	*15% (ERTH 5151)*	*April 3*
Assignments			
Theory problems	*12%*		
Lab assignments	*25%*		
Other course requirements			
Presentation (1)	*3%*		
Term project	*10%*		
Term paper		*10% (ERTH 5151)*	

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D	(50-54)
A (85-89)	B (73-76)	C (60-64)	F	(<50)
A- (80-84)	B- (70-72)	C- (55-59)		

Course Policies

- *Make-up arrangements for the missed labs, presentations, and tests can be done only if discussed with the instructor ahead of time.*
- *Classes cancelled due to the weather can be re-scheduled if there is a time slot fitting in the schedule of all the students.*
- *All assignments including labs and theory problems are to be done individually. The students may discuss the problems with each other but no part of the assignment should be copied from someone's work*

Course Content

- *Introduction: Classification of ore deposits, ore genesis, definitions, natural resources*
- *Igneous ore-forming processes*
- *Magmatic-hydrothermal ore-forming processes*
- *Hydrothermal ore-forming processes*

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- *Surficial and supergene ore-forming processes*
- *Sedimentary ore-forming processes*
- *Fluid inclusions, geochemical and geophysical methods used in exploration*
- *Global Tectonics and Metallogeny*
- *Gem Deposits, diamond exploration*
- *Strategic metals, REE deposits*
- *Appalachian Metallogeny*
- *Economic Geology*

the course includes guest lectures by experts on selected topics