

Earth Sciences 3371B, Metallogeny II: Ore Deposit Models 0.5 Course

2 lecture hours, Tuesday and Thursday 1:30 to 2:30 Room 36 P&AB

3 laboratory hours, Thursday 2:30 to 5:30, 6:00 to 9:00 Room 1065 B&G

Prerequisites: Earth Science 3370A or Written Permission from the Dean

Instructor: Prof. Norman A. Duke, nduke@uwo.ca, 519-661-3199, Off. 1081 B&G

Description: The material covered builds directly on Earth Sciences 3370A.

Metallogenic models are applied to a wide spectrum of deposit types. Emphasis is placed on establishing geological criteria for mineral exploration. Laboratory work focuses on reflected light microscopy in the practical study of ore suites. Regular attendance and timely completion of assignments expected.

Syllabus: Lecture Topics

Laboratory Exercises

- 1) Ore deposit models of metallogenic processes
Ore Deposits Associated with Granite Magmatism
- 2) Granite series and magmatic-hydrothermal ore-types
- 3) Pegmatite deposits -Pegmatite deposits*
- 4) Porphyry Cu-Mo deposits -Porphyry deposits*
- 5) Climax-type Mo deposits
- 6) Contact metasomatic skarn deposits -Skarn deposits*
- 7) HHP granites and pyrometasomatic Sn deposits -Tin deposits*
- 8) Mesothermal vein deposits
- 9) Epithermal vein and hot spring deposits -Epithermal deposits*
- Ore Deposits Associated with Sedimentary Basins**
- 10) SEDEX models of ore genesis - Open labs for working on an Ore Report** based on Study of an Ore Suite Selected from the Suffel Collection
- 11) Shale-hosted Pb-Zn-Ag deposits
- 12) Carbonate-hosted Irish-type Pb-Zn-Ba deposits
- 13) Mississippi Valley-type Pb-Zn-F deposits
- 14) Sedimentary red-bed Cu-Co deposits
- 15) Metallogeny of Uranium deposits
- Ore Deposits Associated with Alkaline Igneous Complexes**
- 16) Polymetallic Fe-Oxide deposits in A-type granite settings
- 17) REE deposits in core carbonatite complexes
- 18) Diamond-bearing kimberlite pipes
- Ore Deposits Related to Continental Weathering**
- 19) Physical weathering and (paleo)placer deposits
- 20) Geochemical weathering and laterite deposits
- 21) Continental and marine evaporite deposits
- 22) Biogeochemical weathering and soil formation
- Non-metals in the Geotectonic Cycle**
- 23) The fossil fuels coal, oil and gas
- 24) Industrial minerals in the geotectonic cycle
- 25) **Applications of Geochemistry and Geophysics in Mineral Exploration**
- 26) **Global Resources and Sustainable Development in the Minerals Industry**

Materials: Reading material and lab manual provided at cost (25\$)

Evaluation: Laboratory, 5 labs* 25%, ore report** 25% due in early April
Theory, final exam 50%

Scholastic Offences (Web Site: www.uwo.ca/univsec/handbook/appeals/scholoff.pdf)