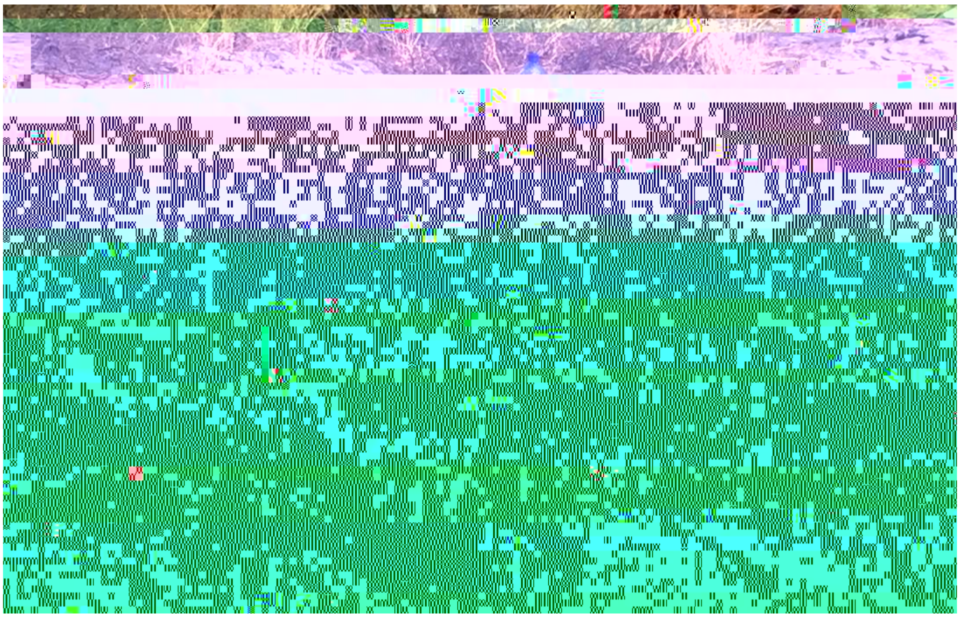
THE UNIVERSITY OF
NEW SOUTH WALES

SCHOOL OF BIOLOGICAL, EARTH
AND ENVIRONMENTAL SCIENCES

GEOS3141
Mineral and Energy Resources
(6 UOC)

MINE2810
(Ore Deposits and Coal Component)
Minerals and Processing
(6 UOC)



MANUAL

2020

THE UNIVERSITY OF
NEW SOUTH WALES

SCHOOL OF BIOLOGICAL, EARTH
AND ENVIRONMENTAL SCIENCES

GEOS3141
Mineral and Energy Resources

LIST OF LECTURES AND LABS

WEEK 1

Tue 15 September

LEC 1, 2-3: Introduction to course (AA)

LAB 1, 3-5: Revision of minerals (IG)

Wed 16 September

LAB 2, 3-5: Mineral Economics / Ore suites 1 (DC)

Thu 17 September

LEC 2, 5-6: Weathering, oxidation and alteration (IG)

Fri 18 September

LEC 3, 12-1: Introduction to Ore Petrology (IG)

WEEK 2

Tue 22 September

LEC 4, 2-3: Volcanogenic massive sulfide and SEDEX deposits I (IG)

LAB 3, 3-5: Ore Petrology (IG)

Wed 23 September

LAB 4, 3-5: Alteration assemblages / Ore suites 2 (IG)

Thu 24 September

LEC 5, 5-6: Volcanogenic massive sulfide and SEDEX deposits II (IG)

Fri 25 September

LEC 6, 12-1: Sedimentary Fe and Mn deposits (DC)

WEEK 5

Coal component for MINE2810 students / normal classes for GEOS3141 students

Tue 13 October

GEOS3141

LEC 13, 2-3: Magmatic deposits I (IG)

LAB 9, 3-5: Ore suites 7 (IG)

MINE2810

LAB/LEC, 3-5: Coal component I (JB)

Wed 14 October

GEOS3141

LAB 10, 3-5: Ore suites 8 (IG)

MINE2810

LAB/LEC, 3-5: Coal component II (JB)

Thu 15 October
GEOS3141 students only
LEC 14, 5-6: Magmatic deposits II (IG)

Fri 16 October
GEOS3141 students only
LEC 15, 12-1: MVT and CMPV deposits (IG)

WEEK 6
19 to 25 October

Fieldtrip week break for GEOS3141 students

WEEK 7

Tue 27 October

LEC 16, 2-3: Critical element deposits I (IG)

LAB 11, 3-5: Analysing and interpreting drillcores and drill chips (IG)

Wed 28 October

LAB 12, 3-5: Ore suites 9

Thu 29 October

LEC 17, 5-6: Critical element deposits II (IG)

Fri 30 October

LEC 18, 12-1: Uranium deposits (NR)

WEEK 8

Tue 3 November

LEC 19, 2-3: Diamond deposits (IG)

LAB 13, 3-5: Lab skills revision (IG)

Wed 4 November

LAB 14, 3-5: Lab skills revision (IG)

Thu 5 November

LEC 20, 5-6: Gem deposits (IG)

Fri 6 November

LEC 21, 12-1: Case study: Bowdens epithermal Ag deposit (IG)

2. COURSE LOGISTICS

This course component forms part of GEOS3141 (6 uoc) and MINE2810. GEOS3141 extends for all 10 weeks and includes the mineral (ore and coal) and the petroleum geology component. The geology component of MINE2

5. RESOURCES

Moodle: Lecture notes and other references.

Books: Evans, A.M., 1997, An introduction to economic geology and its environmental impact, P 553/62

Australasian Institute of Mining and Metallurgy, 1998,

7.

9. Ore Deposit Suites and Laboratory Reports

The laboratories will focus on a suit of world-class mineral deposits. Literature on each deposit is available on Moodle and in the UNSW laboratory. Apart from the formal lab session times, you may make use of the laboratory when not being used for other classes.

<u>Do not remove any of the rocks or sections from the laboratory.</u>

GEOS3141

General examination of the ore suites

1. Examine the specimen sets from all the deposits listed below and complete a summary sheet for ten of the deposits, representing at least five deposit types.
2. For each deposit suite you are required to study the hand specimens provided, including the thin and polished sections where available.
3. At least one paper on the deposits examined should be read.
4. Feel free to work in small groups in the lab but the <u>summary sheets must be written individually</u>.

Detailed examination and report on one of the ore suites

5. Select one of the deposits and, in addition to the summary page, write a brief technical report describing the form of the deposit and its host rocks and outlining current understanding of the deposit genesis.
6. The length of this report should be 1,500ς1,700 words and include a detailed analysis of the samples and deposit descriptions. The headings used in the summary sheet provide a good basis for the headings you should use in your report but do not need to be adhered to strictly.
7. Many features of the deposit and your account of deposit genesis will need to be summarised from the literature. When using information obtained from the provided literature be careful not to plagiarise. Rephrase text into your own words. Do not copy text verbatim. Reference correctly
8. Feel free to work in small groups in the lab but the <u>reports must be written individually</u>. If you ƘaǿŜ ǿ2ǁ1ŜŘ ǿʎűK 2űKŜǁ ăűdzŘŜyű űKŜy Ijdz2űŜ èŽdzǁ ǇaǁűyŜǁóăúΩ yaϒŜóăú ʎyűKŜ ǁŜǇ2ǁű ƘŜaŘʎyƎ φ
9. The reports are due as per the schedule on page 2 of the Manual.

MINE2810

General examination of the ore suites

1. Examine five specimen sets, each from different deposit and complete a summary sheet for those five deposits.
2. For each deposit suite you are required to study the hand specimens provided. Examination of the thin and polished sections is optional.
3. At least one paper on the deposits examined should be read.
4. Feel free to work in small groups in the lab but the <u>summary sheets must be written individually</u>.

Detailed examination and report on one of the ore suites

5. Select one of the deposits and, in addition to the summary page, write a brief technical report describing the form of the deposit and its host rocks and outlining current understanding of the deposit genesis.
6. The length of this report should be 800ς1,000 words (3 to 4 pages excluding summary sheet and illustrations) The headings used in the summary sheet provide a good basis for the headings you should use in your report but do not need to be adhered to strictly.
7. Many features of the deposit and your account of deposit genesis will need to be summarised from the literature. When using information obtained from the provided literature be careful not to plagiarise. Rephrase text into your own words. Do not copy text verbatim. Reference correctly.
8. Feel free to work in small groups in the lab but the <u>reports must be written individually</u>. If you have worked with other student then quote your partner(sǘ name(s) in the report heading.
9. The reports are due as per the schedule on page 2 of the Manual.

All summary sheets and

Lanier, G., John, E.C., Swensen, A.J., Reid, J., Bard, C.E., Caddey, S.W. and Wilson, J.C., 1978, General Geology of the Bingham Mine, Bingham Canyon, Utah. Economic Geology, 73:1228-1241.
Lees, T., Khin Zaw, Large, R.R. and Huston, D.L., 1990, Rosebery and Hercules Copper-Lead-Zinc Deposits. In: F.E. Hughes (Ed), Geology of the Mineral Deposits of Australia and Papua New Guinea, 1241-1247.
Lindhorst, J.W. and Cook, W.G., 1990, Gidginbung Gold-Silver Deposit, Temora. In: F.E. Hughes (Ed), Geology of the Mineral Deposits of Australia and Papua New Guinea, 1365-1370.
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McKay, W.J. and Hazeldene, R.K., 1987, Woodlawn Zn-Pb-Cu sulfide deposit, NSW, Australia: An interpretation of ore formation from field observations and metal zoning. Economic Geology, 82:141-164.
Mernagh, T.P., Wyborn, L.A.J. and Jagodzinski, E.A., 1998, Unconformity-related U-Au-PGE deposits AGSO Journal of Australian Geology and Geophysics, 17:197-205.
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Thompson, J.F.H, Lessman, J. and Thompson, J.B., 1986, The Temora Au-Ag Deposit: A newly recognised style of high sulfur mineralisation in the lower Palaeozoic of Australia. Economic Geology, 81:732-738.
Yeates, G. 1990, Middleback Ranges Iron Ore Deposits. In: F.E. Hughes (Ed), Geology of the Mineral Deposits of Australia and Papua New Guinea, 1045-1048.