

Sault College  
of Applied Arts and Technology  
sault ste. marie

Course Outline

FIELD GEOLOGY <sup>II</sup>

GEO 214 - ~~5~~4

revised January, 1975 by J. Giguere

FIELD GEOLOGY

GEO 214

GENERAL OBJECTIVES:

The course is designed to give the student as much field time as possible so that he may develop the necessary field techniques that have been taught in the classroom. Because of the short duration of the course, it is required that the student receive as much practical, hands-on training, as possible during the early part of the 3rd semester.

The course material will involve field and classroom projects that are realistically oriented toward industry and that the student will be doing after receiving his technician's diploma.

FIELD GEOLOGY GEO-214

Topic Number	Suggested Periods	Topic Description	Reference
1	22	<u>EXAMINATION OF PROSPECTS</u> -nature of the preliminary field examination -mapping the showing -locating the showing with respect to property boundaries -sketching outcrops -use of character samples -researching the history of the prospect -reporting examination results -field exercises on old prospects -preparation of reports and maps	
2	10	<u>REGIONAL GEOLOGICAL MAPPING PROJECT</u> -geological mapping in the Bruce Mines area -examination of area photos -collection of hand specimens for laboratory study -preparation of maps and reports	
3	14	<u>MINING GEOLOGY</u> -duties of the mine geologist -underground geological mapping techniques in drifts, raises, stopes -underground sampling techniques -preparation of geological plans and sections -exploratory drilling, core logging, core sampling, plotting a geological section	
4	24	<u>CALCULATION OF ORE RESERVES</u> -determination of tonnage factor -weighting samples in trenches and drill cores -areas of influence -planimetering areas -calculation of tons and grade -calculation of tons per vertical foot -cutting high irratic assays -weighting by specific gravity	
5	6	<u>DIAMOND DRILL CONTRACTS</u> - information required by the contractor	

GENERAL OBJECTIVES

Forward

The course is designed as a continuation of first year field geology (Geo. 114). To complete the objectives below, the student must also have mastered the objectives as outlined for Geo. 113 and Geo. 123.

In order to insite the interest of the student in rocks and minerals the student will be required to collect and present a suite of 50 rocks and minerals, properly identified and mounted. The project is designed to give reinforcement to courses previously taken in mineralogy and petrology. The specimens will be collected both locally, and on field trips, and handed in for grading.

Topic 1: Examination of Prospects.

In preparation for this part of the course the student will examine a series of mineralized zanes at old mining camps in the area. After class instruction the students will be asked to examine the showing on an old mining property as a class project. The student will then be able to do the following:

- (a) Locate the showing with regard to property boundaries.
- (b) Take character samples from the mineralized zone.
- (c) Make a geological map of the zone and the immediate geology.
- (d) Test the zone for response to geophysical methods.
- (e) Draw a geological section through the mineralized zone in detail
- (f) Relate the character of the mineralization and its geological setting to other areas.
- (g) Search the title of the property and the claim status.
- (h) Write a property examination report based on the above objectives.

Topic 2: Photogeology and Geological Mapping.

The student will be instructed in the principles of aerial photography and its relation to field geology. Upon completion of instruction the student will be able to:

- (a) Recognize certain geological features on the photographs and plot them on a map.
- (b) Do elementary interpretation from air photographs.
- (c) Examine certain photographs in the laboratory and complete a geological map of these same photos in the field.

Topic 3: Mining Geology.

The objectives as set out below are designed to help the student to gain an insight into the final stages of field exploration and mining geology. Upon completion of the period of instruction the student will be able to:

- (a) Write out the duties of a geologist in the following areas:
1. Exploration
  2. Mining
    - Development
    - Production work
- (b) Be able to explain, understand and write out the geological mapping procedures in drifts stopes and raises.
- (c) Given certain geological conditions on surface or underground the student will be able to take samples for assay.
- (d) Given a set of geological plans and drill sections prepare geological sections related to the surface geology.
- (e) Given a set of assay plans prepare a set of assay sections and calculate tons and grade.
- (f) Given a string of diamond drill core be able to log the core and plot the results on a geological section.

Topic 4: Examination of rocks in the Elliot Lake Area.  
(Two day field trip)

The project is designed to:

- (a) Help the student interrelate between the archean and proterozoic rocks in the geological time scale.
- (b) Observe various geological formations and structures.
- (c) Correlate surface observations with an underground trip at one of the uranium mines in the area.

Upon completion fo the trip the student will be able to:

- (a) Draw a geological section of the Quirk Lake syncline.
- (b) Construct a geological column of the formations traversed during the field trip.
- (c) Describe in note form the rock out crops encountered during the trip.

SPECIFIC OBJECTIVES:

Upon learning the following objectives, the student will be able to:

1. By employing a 100' tape and compass and by using no major control line, accurately make a map of outcrops, trenches, diamond drill hole collars etc.
2. By employing a 100' tape locate outcrops, trenches, claim corners and diamond drill collars, using a base line and cross lines as main controls, construct a map of the geology and other pertinent features on a property.
3. Choose character samples which best represent the geological-mineralization relationships of a prospect.
4. Choose a sample pattern that will most effectively express the values in a mineralized zone.
5. Know the sources of information available to properly research the history of a mining property.
6. Determine the applicability of geophysical methods on a mining property.
7. Draw a geological cross section of a mineralized zone and relate the geophysics to it.
8. Prepare a brief prospect type report of a prospect given the proper discussion headings.
9. Make geological observations and collect specimens from specific outcrops in the Bruce Mines area and determine the rock types.
10. Construct a geological map from observations made and samples collected in the Bruce Mines area being supplied with a base map of the area.
11. Properly document the map in S.O.N. <sup>o</sup>10 as to title block, geological symbols, geological column and structure.
12. Prepare a geological report from the geological map of the Bruce Mines area and from class handout of Huronian stratigraphy.
13. Prepare a geological cross section of the Bruce Mines area from the geological map.
14. Take, read and correct acid dip tests.
15. Plot the trace of a diamond drill using corrected dip tests and their respective footages.
16. Log a string of diamond drill core and properly describe the geology in note form on log sheets.
17. Write in the proper information required on the top of a drill log sheet.
18. Correlate geological information in drill holes with surface information of a geological or geophysical nature.



20. Plot a tonnage factor curve being given a range of specific gravities.
23. Make out sample sheet in a sample book.
24. Describe the procedure used in channel sampling in underground workings.
25. Given a series of assay values of mineralization in a trench, calculate the average grade across the zone by the assay feet method.
26. Define area of influence.
27. Given a series of drilled sections through a vertical ore body with multiple drill holes per section, calculate the average tons and grade of the ore body.
28. Given a series of vertical diamond drill holes through a flat lying body, determine the total tons, average thickness and total values present.
29. Given a diamond drill hole with irratically high gold values present, determine the cut grade by various methods.
30. Given a diamond drill hole with waste sections in a mineralized zone, determine the average grade.
31. Define minimum stopping width.
32. Given an ore of low grade value determine the average value by weighting by specific gravity.
33. Determine the average grade by frequency weighting.
34. Define composite sample.
35. State the meaning of probably error.
36. State the reason for taking sludge samples.
37. Draw a diagram of a sludge box.
38. List the duties of a mine geologist.
39. By means of diagrams or maps, indicate the techniques used in underground mapping.
40. State the parameters used to classify ore reserves as proven, possible or probable.
41. State the legal position of a drill contractor while engaging work with a company.
42. State the duties of a technician while employed with a company with respect to the drill contractor.