Yukon University	**School of Science**
	GEOL 107 **Geological Field Methods and Mapping I**
	Term: Summer 2025 **Number of Credits: 3**

Course Outline

INSTRUCTOR: Mary Samolczyk
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OFFICE: T1090
DATES: August 20 – August 29, 2024 (not including Sat/Sun)

CLASSROOM: T1090

COURSE DESCRIPTION

This course provides students with a hands-on introduction to geological field methods and mapping. Course topics include field navigation and GPS use, topographic and geologic map use and analysis, effective field notetaking, and the systematic description of bedrock outcrops and soil profiles. Students employ common mapping strategies to construct basic geologic maps at multiple scales and use map data to make cross-section interpretations about subsurface geology. The course also introduces land access and use considerations in Yukon that impact how geoscientists conduct fieldwork, both for research and in industry.

COURSE REQUIREMENTS

Prerequisites: Successful completion of GEOL 105 (Physical Geology) and GEOL 106 (Historical Geology), or by permission of the instructor.

EQUIVALENCY OR TRANSFERABILITY

Receiving institutions determine course transferability. Find further information at:
https://www.yukonu.ca/admissions/transfer-credit

LEARNING OUTCOMES

Upon successful completion of the course, students will be able to:

- characterize exposures of rocks, sediments and soils with systematic approaches to lithologic descriptions and field notetaking.

- construct geologic maps including outcrop extents, contact relationships and basic structural data; infer rock types and contacts in areas without exposed bedrock.

- use compasses, GPS, topographic maps and air photos to perform the basic map-reading and orienteering tasks that are a fundamental requirement for effective geologic mapping.

- draw geologic cross sections to show interpreted subsurface lithologies from collected outcrop data.

- collect representative samples of lithological units in the field using standard collection and recording protocols.

- safely handle and sample diamond drill core and perform basic geotechnical logging.

COURSE FORMAT

Weekly breakdown of instructional hours

This course is taught in a condensed format with 8 full days of instruction. Instruction will be primarily delivered in field settings around the Whitehorse area, though University facilities will be utilized for some lecture topics. Students will meet at the University at 8:30 am each morning and return by 5 pm. Students are expected to spend an additional 2-3 hours each evening finishing coursework requirements. The total course commitment is estimated at 80 hours (64 hours instruction, 16 hours outside coursework).

An optional (but strongly encouraged) field trip may be run on the weekend between the two weeks of the field course; offering is dependent on local industry availability and participation. If this component of the field course is offered, participants will camp for one to two nights; transportation and food is provided and camping equipment can be obtained for those who do not have their own gear. A program instructor will be in touch with you regarding this component of the field course.

EVALUATION

Participation	20%	Participation will be assessed daily using criteria detailed in the Participation Metrics document distributed to students.
Final Map and Report	25 %	Due following the completion of the field mapping component (tentative due date: September 09, 2024)
Field Notebook Evaluation	15 %	Evaluation following Day 1 and Day 5 to assess quality (and improvement)
Daily Assignments	25 %	Due at the start of each subsequent field exercise.

Oral Exam	15%	Oral examinations will be scheduled within the final day of the field school.
Total	100%	

Attendance & Participation

Students are required to attend the field course in its entirety. If extenuating circumstances arise, a course of action will be decided upon by the instructor and the Chair of the School of Science. The instructor MUST be informed prior to absence. Field course exercises must be completed during class hours, with the instructor present.

Students must be prepared for inclement weather. In the case of severe weather (e.g., lightning), appropriate safety precautions will be taken, and if the weather continues, students will return to the University.

Each student will be critically assessed on their participation during the field course. A grading rubric for assessment of participation will be provided to each student at the start of the field course. Students are required to come to class each day alert, engaged, and open to actively participating in activities. Following the conclusion of each field exercise, students and instructors will take time to collectively debrief and discuss personal perceptions of the success of the exercise, challenges, and opportunities for both personal and group growth.

Assignments

Students are required to hand in completed field school activities at the beginning of the subsequent day's program (i.e. 8:30 am). Generally, assignments are tailored such that data collection is completed within the field day; however, additional time will be required of the student in the evenings to complete reports, finish geologic maps, etc.

At the end of the course, students will draft a detailed (1:1000) bedrock geology map of a small area. This final-copy map will be constructed in groups from field data collected by the students and will include a cross-section and formal report describing the lithologies observed.

Oral Exam

An oral exam will be administered to each student by the instructor and teaching assistant. This exam tests students on their knowledge of concepts presented within the course – no outside material will be incorporated.

COURSE WITHDRAWAL INFORMATION

Refer to the YukonU website for important dates.

TEXTBOOKS & LEARNING MATERIALS

There is no required textbook. An equipment list will be sent to students well in advance of the start of the course. The University is not responsible for basic field gear (e.g. hiking boots, raincoat, etc.) In addition, basic "personal" geology items (rock hammer, hand lens, etc.) may not be provided, and the equipment list will include suggestions for economical purchase of those items. More specialized geology equipment (compasses, levels, soil shovels, etc.) will be provided by the program, as will safety equipment.

ACADEMIC INTEGRITY

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document.

Please refer to Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.

ACCESSIBILITY AND ACADEMIC ACCOMMODATION

Yukon University is committed to providing a positive, supportive, and barrier-free academic environment for all its students. Students experiencing barriers to full participation due to a visible or hidden disability (including hearing, vision, mobility, learning disability, mental health, chronic or temporary medical condition), should contact Accessibility Services for resources or to arrange academic accommodations: access@yukonu.ca.

TOPIC OUTLINE (tentative and subject to change):

Module	Topics
1	**Field safety:** emergency response plans; bear awareness; effective radio communications; field safety considerations [classroom]
2	**Land tenure and access** Introduction to land types in Yukon (Crown, Category A/B, etc.) and land access considerations for geological investigations [classroom]. How to access land tenure information, and best practices for initiating access conversations [classroom]
3	**Introduction to topographic maps:** contour lines; projections; grids and coordinate systems; magnetic declination; orienting and using maps for navigation; constructing topographic profiles [classroom, field]
4	**Introduction to Geographic Positioning Systems (GPS):** theory and technological developments, accuracy vs. precision and GPS, data collection and data download to database software, Google Earth etc. [classroom, field]

5	**Basic field navigation and measurement tools**: Geologic compasses; measurement of azimuth (sighting) and inclination; methods for measuring distance; height calculations; triangulation; techniques for effective navigation without GPS. [field]
6	**Field notebooks and notetaking guidelines:** reporting responsibilities and intellectual property; daily introduction components; structure of observations and interpretations; sample naming protocols [classroom, field]
7	**Outcrop descriptions:** general features of exposures; lithologic descriptions and their structure; structural features; outcrop sketches; interpretations and pitfalls [field]
8	**Geologic maps**: lithologic and structural features; contacts; legends and their structural; unit abbreviations and their meaning; common symbols [classroom]
9	**Geologic mapping styles and strategy**: contact mapping; traverse mapping; closed traverses and closure error; exposure mapping [field]
10	**1:1 000 mapping project**: selection of appropriate mapping strategy for map area based on initial lithologic and structural observations; detailed mapping activity; final map drafting with legend construction; final lithologic descriptions. Construction of cross-sections for subsurface interpretations. [field]
11	**Surficial deposits and soils**: soil formation processes and factors; soil profile descriptions; exploration grids and soil sampling techniques [classroom, field]
12	**Diamond drill core**: handling, sampling, and geotechnical logging (recovery, RQD, fracture density, etc.). [laboratory]