**GEOL 4719/5719 Field Analysis of Crystalline Rocks** Spring 2021

Pre-course assessment

# The following are listed as learning objectives for this course. As part of an effort to track the effectiveness of this course and its design, and to improve it further in the future, we ask you to take this brief pre-course assessment. A similar request (but shorter!) will come mid-way through the course and at the end.

# Please provide a personal level of confidence ranking for each one of the stated objectives. Use a scale of 1-5, where 1 means a “very low” and 5 means a “very high” level of confidence in your current ability (without taking this or a similar class) to perform that task.

The syllabus states:

At the end of this course, you will generally be able to:

1- Design a field strategy to collect or select data in order to answer a geologic question.

Your rating before the course \_\_\_\_\_\_\_\_

2- Collect accurate and sufficient data on field relationships and record these using disciplinary conventions (field notes, map symbols, etc.).

Your rating before the course \_\_\_\_\_\_\_\_

3- Synthesize geologic data and integrate with core concepts and skills into a cohesive spatial and temporal scientific interpretation.

Your rating before the course \_\_\_\_\_\_\_\_

4- Interpret earth systems and past/current/future processes using multiple lines of spatially distributed evidence.

Your rating before the course \_\_\_\_\_\_\_\_

5- Develop an argument that is consistent with available evidence and uncertainty.

Your rating before the course \_\_\_\_\_\_\_\_

6- Communicate clearly using written, verbal, and/or visual media (e.g., maps, cross-sections, reports) with discipline-specific terminology appropriate to your audience.

Your rating before the course \_\_\_\_\_\_\_\_

7- Work effectively independently and collaboratively (e.g., commitment, reliability, leadership, open for advice, channels of communication, supportive, inclusive).

Your rating before the course \_\_\_\_\_\_\_\_

# The following is a list of specific topics and concepts that will be encountered in the first half (first two parts) of this course. At the bottom of the list, please indicate on a scale of 1-5 your personal level of confidence in this overall content now, before taking the course. Again use a 1-5 scale where 1 means “very low” and 5 means “very high” confidence.

The syllabus states:

**Some additional specific topics or concepts that will be covered by all during the course include:**

* Rock types encountered: Granite and granodiorite, quartzite, schist.
* Stratigraphic, structural and geologic mapping concepts encountered: Strike and dip, trend and plunge, relict bedding in metasedimentary rocks, multiple sets of foliations, fold geometry (axial planes and surfaces, fold axes and hinge lines), ductile shear zones, mylonite.
* Uncertainty in field data collection
* Coming up with hypotheses while collecting field data and designing ways to test them.
* Thinking about and presentations of 3-dimensional geologic structures
* Integrating outcrop evidence into a 3-D structural model.
* Create a geologic map, including lithological contacts, foliations, and folds.
* Construct a geologic cross section based on topography and surficial geologic map data.
* Write a report that evaluates possible models to explain structure from field data.
* Identify the strengths and weaknesses of various data for testing geologic models.
* Learning to use StraboSpot.

# Before the course \_\_\_\_\_\_\_\_\_

# The following is a list of questions related to tectonic analysis of igneous and metamorphic rocks. They are also related to some options that you will have in the second half of this course to integrate some specific analytical techniques and datasets into your study. For each item, please indicate on a scale of 1-5 your personal level of confidence in this subject now, before taking the course. Again use a 1-5 scale where 1 means “very low” and 5 means “very high” confidence. Also, for each question, please include a brief response in words. This is not graded, but merely intended to get a baseline understanding of your background, and perhaps to get you thinking about which of these questions might be more intriguing to you.

# *How do outcrop-scale structures in igneous and metamorphic rocks (e.g., foliations, lineations, and folds at different scales, and potentially multiple generations of them) and their geometries relate to one another and to larger regional tectonic histories?* Before the course \_\_\_\_\_\_\_\_\_

# *What are some field and laboratory methods that can be used to determine the relative and absolute ages of pluton crystallization (or magmatic events)?* Before the course \_\_\_\_\_\_\_\_\_

# *What are some field and laboratory methods that can be used to determine the relative and absolute ages of metamorphic and deformation events?* Before the course \_\_\_\_\_\_\_\_\_

# *What are some field and laboratory methods that can be used to determine the relative and absolute ages of deposition of sediments that are now metamorphosed in the rock record?* Before the course \_\_\_\_\_\_\_\_\_

# *How can microstructures in rocks be related to larger regional tectonic histories?*

# Before the course \_\_\_\_\_\_\_\_\_

# *How can metamorphic minerals and mineral assemblages be related to larger regional tectonic*

# *histories?* Before the course \_\_\_\_\_\_\_\_\_