GLY 101 – Natural Hazards

Scientific Literacy & Inquiry

Instructor Name: Dr. James Boyle

Office: Cooke 453

Course Location: Natural Science Complex 215

Course Time: Tuesday/Thursday 11:10AM-12:25PM

Student Hours: Monday (in-person) 9:30-11AM, Thursday (zoom) 1-2:30PM, or by appointment

Zoom Room Link: https://buffalo.zoom.us/j/4027616352?pwd=NHcreUErRFFCVzlTNVZBZ0FGYmp2UT09

Email: jamesboy@buffalo.edu

With COVID-19 continuing to spread throughout the country setting we are all required to follow sensible health precautions, including masking. Everybody must follow the UB and New York State health guidelines and remember that those rules are to protect others as well as yourself.

Public Health Compliance in Classroom setting:

The most current health guidelines can be found here (https://www.buffalo.edu/coronavirus/latest-update.html). Currently all persons on campus, regardless of vaccination status, must wear masks indoors in any non-private setting (with the exception of eating in designated areas).

Vaccination is also **required** for all students and those found not to be in compliance will be disenrolled from their courses but still financially responsible for those courses.

You are also required to complete your daily health check and if you are feeling ill you should stay home. If you are unable to attend class you should contact the professor (Dr. Boyle) about accommodations to complete any work you might miss.

Course Description:

This Scientific Literacy and Inquiry course explores the solid Earth and ways that ongoing, natural processes act to harm people and property. The course aims to put geological hazards in a broader context by examining the latest science at the micro (e.g., minerals), human (e.g., why tsunamis are such efficient and massive killers) and global (e.g., global effects of asteroid impacts or super volcano eruptions) scales. We will examine the history of scientific discovery and thought about natural hazards and global catastrophes on both human and geologic timescales. We will use case studies and debates to clarify science vs. pseudo-science, current controversies, and how natural (as well as some human-induced) hazards impact us in Western New York.

This course partially fulfills a General Education requirement in Natural sciences. However, completing all three courses, GLY 101 LEC, GLY 102 LEC and GLY 105 LAB, with this courses lab sequence would fulfill the Scientific Inquiry and Literacy Requirement as well as the Natural Sciences General Education requirement.

Student Learning Outcomes:

Having completed the Scientific Literacy and Inquiry sequence, students will be able to:

Learning Outcomes	Student Achievement of this Learning Outcome will be Assessed by:
1. Demonstrate that scientific knowledge applies across multiple scales of size and/or time.	Passing grade on quizzes 3-6 and critical thinking assignments 3 & 4
2. Demonstrate understanding of and employ the scientific method.	Passing grade on exams I, II, & III and critical thinking assignments 1 & 2
3. Demonstrate an understanding that science is a continuous process and that our understanding of scientific phenomena has changed across time.	Passing grade on quizzes 1 & 2 and critical thinking assignments 1 & 4
4. Demonstrate an understanding of how scientific principles are used to solve tangible problems.	Passing grade on critical thinking assignments 3 & 4 and exams II & III
5. Recognize key ethical issues in scientific practice.	Passing grade on critical thinking assignments 2, 3, & 4 and exams II & III
6. Distinguish scientific information from pseudo-scientific information and demonstrate an understanding of the nature of legitimate scientific debate.	Passing grade on critical thinking 1, 5, & 6 and exam III

Course Materials:

Textbook: We will be using an open online textbook which can be found here.
Top Hat: Top Hat is a learning software platform that we will be using during the course. Student's must create an account and subscribe at TopHat.com, once that is completed students can join the course using the course code (685527). Additional details for signing up on Top Hat can be found here. In addition to homework assignments being found there I will be using the platform to get live feedback during lectures.

Lecture: Lectures slides will be made available on UBLearns the night before the lecture will be given and on Top Hat at the start of class. In addition, the live lectures will be recorded and the recordings made available on UBLearns the day after each lecture.

Students Hours: I will be available in my office, Cooke 453, on Monday 9:30-11AM and over zoom from 1-2:30PM (zoom link) on Thursdays. If neither of those times works email me to find an alternative time slot. Question via email are always welcome but make sure the email has the course number and your name is in the email somewhere.

Course Requirements:

Attendance: I will not be scoring attendance as an explicit part of the course's grade. However, I would strongly suggest that you attend every lecture you are able to because you will get much more information than by trying to read the book or lectures alone and are likely to perform better on assignments and exams. If you expect that you may need to step out of the lecture during class time please place yourself towards the back and edges of the lecture hall to minimize the disturbance to your fellow students.

Devices: Because we will be using Top Hat in class (and because of dual authentication) students are expected to have either a smartphone or laptop in class. If you find yourself tempted to shop, look at social media, videos, etc. during class please at least move yourself to the back of the class to minimize distractions to other students. Obviously, I'd prefer if you did not do these things at all during class but I'm not going to police you on it unless it becomes a class disruption.

Readings: There are assigned readings for each lecture (the Tuesday/Thursday readings are separated by a semicolon in the course schedule at the end of this document) which should be read before the start of class. Some of the material for the quizzes will closely parallel the readings and thus help to keep those scores high.

Grading Policy: (see course schedule at the end of this document)

Final grades are letter-based (see here for more information on UB grade policy) and are a weighted average of quizzes, critical thinking assignments, and exams throughout the semester. There is no final exam during final exam week at the end of the semester.

Learning assessments will be graded based on rubric criteria and weighted according to the following break-down.

Weighting	Assessment / Assignment
20%	Six Quizzes (4% each, with the lowest quiz grade dropped at the end of the semester)
20%	Critical Thinking (5% each)
60%	Exams (20% each)

Quizzes: These will be a series of multiple choice, matching, or other short-form questions covering materials from readings and lectures due by the start of class (i.e. 11:10AM) on September 14, Sep. 28, October 12, Oct. 26, November 16, and December 7th. These quizzes will be placed on Top Hat and become available a week before they are due. Each attempt will have a 1hour window to complete once started (though they should not take nearly that much time). Student's will have three attempts to complete each quiz which will pull from a large pool of questions (i.e. only some questions may overlap between different attempts of the same quiz). I will average two highest quiz grades of the three attempts to calculate your score for that quiz. Even if you receive 100% on your first attempt you must take the quiz a second time. The lowest quiz grade at the end of the semester will be dropped when calculating your final grade.

Critical Thinking Assignments: These will be a combination of short-form and long-form questions covering materials from the lecture and readings with some references to outside materials. These will often represent case studies and more open-ended questions dealing with the uncertainties and trade-offs inherent in topics like energy and hazard mitigation. These assignments are due at the start of class (i.e. 11:10AM) on September 21, October 19, November 2, and November 23. These assignments will be made available on Top Hat a week before they are due. There will be no time-limit on submission and two attempts will be allowed. However, in this case the second attempt submission is meant as a safe-guard against technical issues or other unforeseen circumstances rather than a means to improve your score.

Exams: There will be three exams taken during class time in-person. These will occur on September 30, November 4, and December 9. The exams will be paper and pencil and be a combination of multiple choice, matching, fill-in-the-blank, and short answer. You will have the whole class period to complete each exam. Exams will focus on the material covered in the course since the previous exam and thus are not explicitly cumulative. However, the material does build on itself and so ideas from earlier in the semester will still need to be applied in many cases. Make sure to bring your UB ID to each exam day to confirm your identity when you hand in your exam.

Make-up Policy:

Especially in light of the ongoing COVID-19 pandemic it is clear that unforeseen events can, and inevitably will, occur. If circumstances arise that you are unable to complete an assignment before the due date email me (jamesboy@buffalo.edu) when you can safely do so (i.e. do not worry about emailing me the day of an exam if you are in a car accident and have to go the hospital). In most cases extensions on due dates should be possible.

Final Grades:

Grade	Quality Points	Percentage
A	4.0	94.0 - 100
A-	3.67	90 – 93
B+	3.33	87 - 89
B	3.00	84 – 86
B-	2.67	80 - 83
C+	2.33	77 – 79
C	2.00	74 – 76
C-	1.67	70 - 73
D+	1.33	67 – 69
D	1.00	65 - 66
F	0	< 65

Academic Integrity:

Academic integrity is a fundamental university value. Through the honest completion of academic work, students not only advance their educational objectives, they sustain the integrity of the university and facilitate the transmission of knowledge and culture based upon the generation of new and innovative ideas. The Undergraduate Academic Integrity Policy provides additional information about what UB considers to be academic dishonesty and the possible consequences for violating UB's policies on academic integrity. In particular, you should be sure that you are aware of what UB considers to be academic dishonesty and that you understand how to avoid academic dishonesty. If you are unsure about the meaning of any of this information please talk to me or your academic advisor about them and we will try to clarify our expectations.

Accessibility Resources:

If you have any disability which requires reasonable accommodations to enable you to participate in this course, please contact the Office of Accessibility Resources, 60 Capen Hall, 645-2608, and also the instructor of this course. The Office of Accessibility Resources will provide you with information and review appropriate arrangements for reasonable accommodations.

Available Resources on Sexual Assault:

UB is committed to providing an environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic and dating violence and stalking. You may call UB's Office of Equity, Diversity and Inclusion at (716) 645-2266 for more information or visit their website.

Student Wellness:

As a student you may experience a range of issues that can cause barriers to learning or reduce your ability to participate in daily activities. These might include strained relationships, anxiety, high levels of stress, alcohol/drug problems, feeling down, health concerns, or unwanted sexual experiences. Counseling, Health Services, and Health Promotion are here to help with these or other issues you may experience. You learn can more about these programs and services by contacting:

Counseling Services:	120 Richmond Quad (North Campus), phone 716-645-2720 202 Michael Hall (South Campus), phone: 716-829-5800
Health Services:	Michael Hall (South Campus), phone: 716- 829-3316
Health Promotion:	114 Student Union (North Campus), phone: 716- 645-2837

UB Curriculum Capstone:

If you are completing this course as part of your UB Curriculum requirements, please select an 'artifact' from this course that is representative of your learning and upload it to your UBPortfolio account. Templates have been created for this purpose. Artifacts include homework assignments, exams, research papers, projects, lab reports, presentations, and other course materials. Your final UB Curriculum requirement, UBC 399: UB Curriculum Capstone, will require you to submit these 'artifacts' as you process and reflect on your achievement and growth through the UB Curriculum. For more information, see the UB Curriculum Capstone website.

Dates	Week	Tuesday	Thursday	Reading (textbook sections)	Assignments (due Tuesday before class)
8/30-9/3	1	A	B	1	-
9/6-9/10	2	C	D	2.1-2.2; 2.3-2.7	-
9/13-9/17	3	E	F	9; 3.2-3.4	Quiz 1
9/20-9/24	4	G	H	Supplementary	Critical Thinking 1
9/27-10/1	5	I	**Exam I**	4.1-4.4	Quiz 2
10/4-10/8	6	J	K	4.5; 6	-
10/11-10/15	7	L	M	5.1-5.2; 5.3	Quiz 3
10/18-10/22	8	N	O	8.6-8.8; 7.2	Critical Thinking 2
10/25-10/29	9	P	Q	7.1 & 7.3-7.4; 16.2	Quiz 4
11/1-11/5	10	R	**Exam II**	16.1 & 16.3	Critical Thinking 3
11/8-11/12	11	S	T	15.1 & 15.3; 15.2 & 15.4	-
11/15-11/19	12	U	V	14.1-14.4; 11.1-11.5	Quiz 5
11/22-11/26	13	W	Fall Recess	11.6-11.7	Critical Thinking 4
11/29-12/3	14	X	Y	10.3; 10.1-10.2	-
12/6-12/10	15	Z	**Exam III**	-	Quiz 6
12/13-12/20	16	Final Exams Week			

			Lecture Topics
			A Introduction
Exam I	CT 1	Quiz 1	B Understanding Science
			C Plate Tectonics I
			D Plate Tectonics II
		Quiz 2	E Plate Tectonics III
			F Minerals I
			G Minerals II
	CT 2		H Rock Cycle
		Quiz 3	I Igneous rocks
			J Volcanoes
Exam II			K Metamorphic Rocks
		Quiz 4	L Sedimentary Rocks I
			M Sedimentary Rocks II
	CT 3		N Geological Time
			O Dating I
		Quiz 5	P Dating II
			Q Economic Geology I
			R Economic Geology II
	CT 4		S Climate Change I
			T Climate Change II
Exam III		Quiz 6	U Glaciers
			V Water I
			W Water II
			X Mass Wasting I
			Y Mass Wasting II
			Z Review

Key for sequence of lecture topics. Colors correspond to material for each exam. Boxes to left of lecture topics are the span of material covered by each exam, critical thinking assignment (CT), and quiz.