ARIZONA STATE UNIVERSITY

GENERAL STUDIES COURSE PROPOSAL COVER FORM

Course information:

*Copy and paste **current** course information from Class Search/Course Catalog.*

College/School: Liberal Arts and Science | Department/School: **School of Earth and Space Exploration**

Prefix: **GLG** | Number: **110/111** | Title: Dangerous Worlds (Lecture and Lab) | Units: 3 + 1

Course description: **Geological studies as they apply to interactions between humans and Earth, Includes geological processes as hazards, resources and global change. Both GLG 110 and 111 must be taken to secure SG General Studies credit**

Is this a cross-listed course? No | If yes, please identify course(s):

Is this a shared course? No | If so, list all academic units offering this course:

*Note- For courses that are crosslisted and/or shared, a letter of support from the chair/director of **each** department that offers the course is required for **each** designation requested. By submitting this letter of support, the chair/director agrees to ensure that all faculty teaching the course are aware of the General Studies designation(s) and will teach the course in a manner that meets the criteria for each approved designation.*

Is this a **permanent-numbered** course with topics? Yes

If **yes**, each topic requires **an individual submission**, separate from other topics.

Requested designation: Natural Sciences–SQ **Mandatory Review:** (Choose one)

*Note- a **separate** proposal is required for each designation.*

Eligibility: Permanent numbered courses **must** have completed the university's review and approval process. For the rules governing approval of omnibus courses, contact Phyllis.Lucie@asu.edu.

Submission deadlines dates are as follow:

For Fall 2020 Effective Date: October 10, 2019 For Spring 2021 Effective Date: March 5, 2020

Area proposed course will serve:

A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study. It is the responsibility of the chair/director to ensure that all faculty teaching the course are aware of the General Studies designation(s) and adhere to the above guidelines.

Checklists for general studies designations:

Complete and attach the appropriate checklist

Literacy and Critical Inquiry core courses (L)
Mathematics core courses (MA)
Computer/statistics/quantitative applications core courses (CS)
Humanities, Arts and Design core courses (HU)
Social-Behavioral Sciences core courses (SB)
Natural Sciences core courses (SQ/SG)
Cultural Diversity in the United States courses (C)
Global Awareness courses (G)
Historical Awareness courses (H)

A complete proposal should include:

- ☒ Signed course proposal cover form
- ☒ Criteria checklist for General Studies designation being requested
- ☒ Course catalog description
- ☒ Sample syllabus for the course
- ☒ Copy of table of contents from the textbook and list of required readings/books

It is respectfully requested that proposals are submitted electronically with all files compiled into one PDF.

Contact information:

Name: Duane DeVecchio | E-mail: ddevecch@asu.edu | Phone: 480-727-2636

Department Chair/Director approval: ***(Required)***

Chair/Director name (Typed): Christopher Groppi Date: 10/21/2019

Chair/Director (Signature):

Proposer: Please complete the following sections and attach appropriate documentation.

ASU--[SQ] CRITERIA

I. - FOR ALL *QUANTITATIVE* [SQ] NATURAL SCIENCES CORE AREA COURSES, THE FOLLOWING ARE CRITICAL CRITERIA AND MUST BE MET:

YES	NO		Identify Documentation Submitted
☒	☐	**A.** Course emphasizes the mastery of basic scientific principles and concepts.	Justification, detailed syllabi/schedules
☒	☐	**B.** Addresses knowledge of scientific method.	Justification, detailed syllabi/schedules
☒	☐	**C.** Includes coverage of the methods of scientific inquiry that characterize the particular discipline.	Justification, detailed syllabi/schedules
☒	☐	**D.** Addresses potential for uncertainty in scientific inquiry.	Justification, detailed syllabi/schedules
☒	☐	**E.** Illustrates the usefulness of mathematics in scientific description and reasoning.	Justification, detailed syllabi/schedules
☒	☐	**F.** Includes **weekly** laboratory and/or field sessions that provide hands-on exposure to scientific phenomena and methodology in the discipline, and enhance the learning of course material.	Justification, detailed syllabi/schedules
☒	☐	**G.** Students submit written reports of laboratory experiments for constructive evaluation by the instructor.	Justification, detailed syllabi/schedules
☒	☐	**H.** Course is general or introductory in nature, ordinarily at lower-division level; not a course with great depth or specificity.	Justification, detailed syllabi/schedules

II. - AT LEAST ONE OF THE FOLLOWING ADDITIONAL CRITERIA MUST BE MET WITHIN THE CONTEXT OF THE COURSE:

☒	☐	**A.** Stresses understanding of the nature of basic scientific issues.	Justification, detailed syllabi/schedules
☒	☐	**B.** Develops appreciation of the scope and reality of limitations in scientific capabilities.	Justification, detailed syllabi/schedules
☒	☐	**C.** Discusses costs (time, human, financial) and risks of scientific inquiry.	Justification, detailed syllabi/schedules

III. - [SQ] COURSES MUST ALSO MEET THESE ADDITIONAL CRITERIA:			
YES	**NO**		**Identify Documentation Submitted**
☒	☐	**A.** Provides a substantial, quantitative introduction to fundamental principles governing behavior of matter and energy, in physical or biological systems.	Justification, detailed syllabi/schedules
		B. Includes a college-level treatment of some of the following topics **(check all that apply below):**	Justification, detailed syllabi/schedules
☐	☐	**a.** Atomic and molecular structure	
☐	☐	**b.** Electrical processes	
☒	☐	**c.** Chemical processes	Justification, detailed syllabi/schedules
☒	☐	**d.** Elementary thermodynamics	Justification, detailed syllabi/schedules
☒	☐	**e.** Electromagnetics	Justification, detailed syllabi/schedules
☒	☐	**f.** Dynamics and mechanics	Justification, detailed syllabi/schedules
[SQ] REQUIREMENTS CANNOT BE MET BY COURSES:			
• **Presenting a qualitative survey of a discipline.**			
• **Focusing on the impact of science on social, economic, or environmental issues.**			
• **Focusing on a specific or limiting but in-depth theme suitable for upper-division majors.**			

Course Prefix	Number	Title	General Studies Designation
GLG	110/111	Dangerous Worlds (Lecture and Lab)	SQ

Explain in detail which student activities correspond to the specific designation criteria. Please use the following organizer to explain how the criteria are being met.

Criteria (from checksheet)	How course meets spirit (contextualize specific examples in next column)	Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)
	SEE Detailed Justification on the following pages.	
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		.

SQ Justification: GLG 110/111 Dangerous Worlds

I. FOR ALL QUANTITATIVE [SQ] NATURAL SCIENCES CORE AREA COURSES, THE FOLLOWING ARE CRITICAL CRITERIA AND MUST BE MET:

Criteria (From Checklist)	How course meets spirit (contextualize specific examples in next column)	Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)
		Unit numbers and Lab numbers in this column refer to the detailed topic areas covered in the Lecture and Lab schedules, respectively.
I. A. Course Emphasizes the mastery of basic scientific principles and concepts.	This course requires that students learn fundamental scientifc principles related to active processes in the atmosphere, hydrosphere, and lithosphere.	For Example: Physics: Units 2, 4, 7, and 10; Labs 9 and 10: Energy Transfer Mechanisms, Mechanics, Kinetics, Conservation Laws Chemical: Units 1, 5, 10; Labs 3, 7, 10 : Hydrosphere-lithosphere-atmosphere interactions, photosynthesis, greenhouse effects Thermodynamics: Units 2, 3, 4, 5, 7; Lab 8: Temperature, Latent Heat, Greenhouse Effect Electrical: Units 3: Static Electricity
I. B. Addresses knowledge of scientific Method	Use of scientific method as a rigorous means of addressing scientifc questions is a unifyig theme throughout the course and is addressed in all Lecture units and labs	For Example: All Lecture Units and Labs: Focus on real world data of natural processes where students are expected to observe, hypothesize and draw conclusions from data in order to understand and interpret complex natural processes.
I. C. Includes coverage of the methods and of scientific inquiry that characterize the particular	Application of the scientific method is exhibited in most labs and is the fondation of most in-class activities and labs.	For Example: Units 2, 3, 4, 6 in-class activities: Involve observing data plots or natural phenomena, hypothesize processes develop interpretations, and make predictions.

Contiued from previous page		Labs 4–11: Involve the manipulation of data and/or observation of data plots to hypothesize dynamics and process and develop interpretations related to plate tectonics, earthquakes, volcanic eruptions, tsunami inundation, impactors, landslides, etc.
I. D. Address potential for uncertainties in Scientific Inquiry	Inherent to understanding natural hazards and predicting their development, occurrence and impact is a fair amount of uncertainty. As such this is addressed in detail in most lecture units which each deal with forecasting natural hazards	For example: Units 1, 3, 5, 7 and 8: All involve discussion of computer models generated to predict hazardous events. With all models uncertainties are portrayed and discussed. Labs 3–11: For example, in the Volcano lab (Lab 7), students are asked to observe and manipulate real volcano monitoring data. They are then asked to link the data to prediction of subsequent eruptions; eruption prediction, even in 'hind-casting mode', contains significant uncertainty, and Lab 7 illustrates this point. Another example includes the Impactors lab (Lab 9), in which students explore all of the variables that control impact crater characteristics. During this process the students learn that many variables control impact dynamics and crater size, making prediction of the consequences of meteor impacts complex and inherently uncertain.
I. E. Illustrate the usefulness of mathematics in scientific description and reasoning	The course directly addresses the importance of quantitative measurement in scientific description and reasoning.	For example: All 10 lecture units" Involve a quantitative assessment of natural hazards for forecasting probabilities and magnitudes of event in order to quantify risk. Labs 4–11: Require students to use mathematics to, for example, measure the rate of plate motion, quantify offset along faults during large earthquakes and calculate earthquake magnitude, quantify tsunami inundation area, calculate impact crater size for a suite

Contiued from previous page		of impactor characteristics, calculate volcano inflation from instrument data, etc. These calculations are ultimately linked to the impact of hazards on society.
I. F. Includes weekly laboratory and/or field sessions that provide hands-on exposure to scientific phenomena and methodology in the discipline, and enhance the learning of course material	All weekly labs and most lecture units incorporated hands-on sessions, where students engage with scientific methodology.	For example: Units 1, 2, 4, 5, 7: In-class activities explore process-based understanding of natural hazards. Labs 2–11: Require students to do hands-on exercises in which they download data and manipulate the data in order to test hypotheses.
I. G. Students submit written reports of laboratory experiments for constructive evaluation by the instructor	Students receive feedback to weekly lab reports and learning journals.	For Example: Most Lecture units (2–10): Students submit a learning journal in which they are asked to articulate their thought processes and developmental understanding of course content and in-class scientific activities, and which receive written feedback from the professor. All 11 Labs: Students conduct calculations, observe data, test hypotheses, and make interpretations. They then use those data to submit answers to a series of questions related to each task associated with the lab. Students are given multiple attempts to answer the questions, with feedback given for each answer, including guidance to correct incorrect responses.
I. H. Course is general or introductory in nature, ordinarily a lower division level; not a course with great depth or specificity.	The course is a transdisciplinary survey focused on human social interaction with natural earth and environmental processes.	See all Criteria I, above

SQ Justification: GLG 110/111 Dangerous Worlds

II. AT LEAST ONE OF THE FOLLOWING ADDITIONAL CRITERIA MUST BE MET WITHIN THE CONTEXT OF THE COURSE:

II. A. Stresses the understanding of the nature of basic scientific issues.	As a transdisiplinary course organized around human interactions with natural environmental processes, students engagement is focused on the interconnection between society and the natural sciences that govern the environment in which they live.	For example: All 10 Lecture and Lab units: A scientific understanding of the mechanics and dynamic driving natural hazards (e.g., hurricanes, climate change, and volcanoes) and how science interprets these processes are used to forces
II. B. Develops appreciation of the scope and reliability of limitations in scientific capabilities	Students explore the factors behind uncertainties in scientific capabilities as a means to understand personal, geographic, and global risk from disparate natural hazards.	For example: Units 3, 4, and 5: Evaluate computer models for past natural disasters to understand how science either correctly or incorrectly assessed hazards. Nearly all labs, especially Labs 3–11: Prediction of the scale and impact of natural hazards has inherent uncertainty. The labs require students to quantify physical characteristics of past hazardous events, such as tsunami inundation area, earthquake magnitude, and plume height in a volcanic eruption. Due to their scale, their hazardous nature, and the difficulty in accessing their sources (sometimes beneath the earth's surface), this type of quantification is difficult and rather uncertain. During the calculations, students learn which calculations are more uncertain than others and in some cases, they quantify that uncertainty. In addition, they make links between these uncertainties and the difficulty in predicting future hazardous events.
II. C. Discusses costs (time, human, financial) and risk of scientific inquiry	Fundamental to all lecture units is an understanding of the concept of risk and the negative impacts of natural disasters to humans and the cost and time of recovery	For example: All 10 lecture units: Understanding the financial impact at a global, societal, and individual level is strongly emphasized for all hazards in each lecture unit and is the focus of most

Continued from previous page		unit movie quizzes. Most Labs (4–8, 10, 11) focus on past natural disasters that had significant negative impact on local and/or global economies and high death tolls. The link between the physical characteristics of the natural hazard and the human impact is made clear, with particular emphasis paid to differences between natural disasters in developed nations and developing nations.

III. [SQ] COURSES MUST ALSO MEEET THESES ADDITIONAL CRITERIA:

III. A. Provides a substantial, quantitative introduction to fundamental principles governing behavior of matter and energy, in physical or biological systems.	Fundamental to this course is scientific understanding of the basic physics, chemistry, and thermodynamics that govern the natural processes that shape the livable environment, which have both positive and negative effects on human civilization.	For example: All 10 lecture units: Interpretation of weather, climate, earthquake, and flooding data are used in order to calculate rates of change and evaluate hazard probabilities and risk. Most Labs (Labs 3-11): Focus on the fundamental physical and chemical principles that govern the behavior of the earth system during earthquakes, landslides, tsunami, volcanic eruptions, meteor impact events, hurricanes, tornadoes, etc.
III. B. Includes college-level treatment of the following topics:	See subsets below	
c. Chemical processes	Students examine the chemical interactions within and between the hydrosphere, lithosphere, and atmosphere	For example: Units 1, 2, 3, 4, 5, 8 and 10: Chemical interaction among Earth's geochemical spheres is an integral facet of natural hazards, such as the formation, of clouds, precipitation, thunderstorms, cyclones, and the controls on ocean salinity and pH, volcano types and eruptive character, chemical weakening of rocks leading to mass wasting.
d. Elementary thermodynamics	Understanding conservation of energy is a topic that is particularly	For example: Units 2, 3, 4, and 5: The conversion

Continued from previous page	important to understanding atmospheric properties.	solar of energy to thermal energy and latent heat is relied upon throughout these units. Labs 3, 8, and 11: Lab 3 examines rock weathering, melting, and metamorphosis through heat, pressure, and chemical reactions. Labs 8 and 11 focus on the thermodynamics of atmospheric processes within the context of severe weather and climate change.
e. Electromagnetics	Not a significant portion of this course, but it is discussed as a fundamental energy sources for atmospheric processes and climate change	For example: Unit 2 and 5: Transfer of electromagnetic energy from the sun to heat energy to the oceans and atmosphere, which drives global thermal fluid circulation patterns, which are influenced by greenhouse gas kinetics. Lab 1: Discusses the role of and mechanisms that generate the earth's magnetic field, as well as causes of shifts and reversals of that field. The magnetic field is then linked to the discovery and understanding of plate tectonics.
f. Dynamics and mechanics	Most Lecture units and labs, students engage in concepts central to Newtonian kinematics and dynamics as applied to natural earth, atmospheric and hydrosphere processes.	For example: Units 2, 3, 4, 5, 6, 7, 8, 9, and 10. Effects of wind, water, waves, tectonics, gravity on landscapes as it pertains to effects on humans and infrastructure. Labs 2–11: Address the dynamics and mechanics that govern a wide range of natural hazards.

GLG110/111 Current Catalog Description

GLG 111	**Dangerous World Laboratory** **Course Description:** Basic geological processes and concepts. Emphasizes geology-related environmental problems concerning Arizona. Both GLG 110 and 111 must be taken to secure SG General Studies credit. **Offering School/Colleges Pre-requisite(s):** New College of Interdisciplinary Arts and Sciences -- School of Mathematical and Natural Sciences The College of Liberal Arts and Sciences -- School of Earth and Space Exploration **Allow multiple enrollments:** No **Repeatable for credit:** No **Primary course component:** Lecture **Grading method:** Student Option	1	SG
GLG 110	**Dangerous World** **Course Description:** Geological studies as they apply to interactions between humans and Earth. Includes geological processes and hazards, resources, and global change. Both GLG 110 and 111 must be taken to secure SG General Studies credit. **Offering School/Colleges Pre-requisite(s):** New College of Interdisciplinary Arts and Sciences -- School of Mathematical and Natural Sciences The College of Liberal Arts and Sciences -- School of Earth and Space Exploration **Allow multiple enrollments:** No **Repeatable for credit:** No **Primary course component:** Lecture **Grading method:** Student Option	3	SG & G

GLG 110 Dangerous World

Fall 2019 Syllabus and Schedule

Section 93117 Location (PSF-123) – Monday, Wednesday, Friday 10:45–11:35 am

Instructor: Duane DeVecchio	**Teaching assist: Rachel Holsteen-Bruyere**
E-mail address: glg110@asu.edu	**E-mail address:** bruyere.glg110@asu.edu
Office phone: 480-727-2636	**Office phone:**
Office: PSF-518	**Office location: PSF-186 (Student Success Center)**
Office hours: T11-45-12:45pm W 1-2pm or by Appt.	**Office hours: T 12–1:15pm and F 9:30–1040am**

Course catalog description: Geological and atmospheric studies as they apply to interactions between humans and Earth. Includes Earth processes and hazards, resources, and global change

Course Objectives: The primary objectives of the course are for students to:

1. Understand elemental tectonic, atmospheric, and oceanic processes as they pertain to different natural hazards (e.g., volcanoes, earthquakes, severe weather, climate change)
2. Develop geographic, environmental, and process linkages between different hazards and their occurrences
3. Understand how scientific investigation of natural processes is used to understand hazards and precursor events
4. Analyze scientific data in order to understand hazard forecasting
5. Understand the concept of risk analysis and be able to evaluate local and global risk from different hazards based on geographic, geologic, and/or topographic settings
6. Compare and contrast risk assessment at multiple scales (e.g., individual, community, state, country, global)
7. Understand how the science of natural hazards combined with engineering and proper preparation can minimize the negative effects of natural hazards

Textbook: Natural Hazards, 5th edition (Keller and DeVecchio)

Textbook Description: Earth Processes as Hazards, Disasters and Catastrophes, Fourth Edition, is an introductory-level survey intended for university and college courses that are concerned with earth processes that have direct, and often sudden and violent, impacts on human society. The text integrates principles of geology, hydrology, meteorology, climatology, oceanography, soil science, ecology and solar system astronomy. The book is designed for a course in natural hazards for non-science majors, and a primary goal of the text is to assist instructors in guiding students who may have little background in science to understand physical earth processes as natural hazards and their consequences to society.

Required Readings

Read all textbook chapters outlined in the class schedule. Reading chapters and **Case Studies** within will be critical to success on exams and final course grade

Grading Policies and Percentages

2 Exams (20% ea.)	40%
Chapter Questions & Discussion	30%
Chapter Learning Journal & Activities & Movie Quizzes	30%

Exams (40% of grade; 20% each)
Every 7–8 weeks there will be an in-class exam consisting of various styles of questions. Each exam will be worth 40% of your final grade. The exams will cover both your comprehension of hazard processes as well as your understanding of the five fundamental concepts as they pertain to past hazard events discussed in class and in the textbook. Make up exams will only be granted if you have a note from a doctor, a letter from the university regarding some university-sponsored activity, a copy of a jury summons, a police report, or some other document that can be verified. This legitimate proof for why you cannot attend class that day must be provided to the instructor as far in advance of the exam as possible.

Reading / Chapter Questions and Discussion (30% of grade)
You will be expected to read each chapter **prior** to it being covered in class so you are prepared to ask questions and have discussions with your classmates about the chapter material. "Applying the Five Fundamental Concepts" (A5FC) questions at the end of each chapter will be due by the start of class on the Friday in which we wrap up that topic (**10:45 am many Fridays**). The answers to A5FC will be submitted online through Blackboard, but to receive full credit for these assignments you will **need** to attend the Group/Class discussion that occurs on the Friday due date. Although worth less total points than the exams, a thorough understanding of the material covered in the A5FC questions and in the ancillary discussion will surely result in higher exam scores. **Deadlines** for A5FC homework assignments and dates for in class discussion are included on the *Class Schedule*. Any changes the schedule will be noted in class, therefore regular attendance and keeping current with the Class Schedule, which may change throughout the semester is imperative.

Chapter Topic Journal, Movie Quizzes, and Activities (30% of grade)
For each chapter topic (e.g., cyclones, earthquakes, plate tectonics), you will be expected to submit a brief **Learning Journal** entry into Canvas. A learning journal entry for this class will be composed of a collection of observations, thoughts, or other revelations about the particular Natural Hazards and events discussed in class and described in the textbook that characterize your learning about the particular topic. I expect that most entries will consist of 1 to 2 paragraphs (approximately half page of text) that discuss your new personal insights into the current subject matter. The journal entry may focus on the evolution of your understanding about the science behind the hazard or could focus on your feelings about a particular Case Study from the text or in the news. I would recommend starting the Journal Entry prior to reading the chapter and wrapping them up sometime after our discussions of the science and case studies behind the hazard. Specifically, I recommend writing a sentence or two about each your knowledge or thoughts about the hazard to be discussed prior to reading the text, and then building the bulk of the Journal entry based on how your new understanding of the hazard has changed your perspective. There will be approximately 7-8 **Movie Quizzes** during the semester. Most movie quizzes will be completed online at home through Blackboard, but some may happen during class. For best success on Movie Quizzes I recommend you read through the questions prior to watching the movie and to answer the questions while watching the movie. **Deadlines** for Journal entries and Movie Quizzes are written in the *Class Schedule* and are typically due at the end of the discussion of that topic (typically on Fridays). Any changes the schedule will be noted in class, therefore regular attendance and keeping current with the Class Schedule, which may change throughout the semester is imperative. Some weeks we will have additional in-class **Activities**. Many of the hazard activities are listed in the class schedule, but when they will occur if at all is fluid and missed Activities cannot be made up, so it is critical that you attend every class session.

Grade Posting
Homework assignments, exams and participation points will be promptly tallied and posted to Blackboard at myasucourses.asu.edu. ***You have 7 days after a grade has been posted to dispute an entry***. After the 7-day

period, the grade stands as entered. Do not wait until the end of the semester to review your grades on Blackboard or to work through graded exams and homework assignments returned to you.

Academic dishonesty
Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see http://provost.asu.edu/academicintegrity.

Attendance and Tardiness
Although we will not specifically take role during each class session, regular for-credit in-class activities will be conducted and turned in throughout the semester and cannot be made up if you are absent without prior for Tardiness is discouraged since it disrupts class. Moreover, homework assignments are due at the beginning of class prior to discussion so tardiness will impact your grade on discussion days. Tardy students will not be allowed extra time to make up for the time lost on timed exams. Remember, in-class exams and in-class activities cannot be made up for non-emergency, unexcused absences, or absences that occur without prior notification to the instructor.

Cellular Telephones/Text Messaging/Pagers:
Please turn off all cellular telephones and pagers during class time. If your work situation requires that you be on call, please notify the instructor prior to class. Text messaging is not permitted in this class.

Class Disruption
Class disruptions are defined as activities that distract the instructor or other students from the course content. Such activities include talking or whispering, cell phones ringing, tardiness, or whispering about another tardy student, noisily preparing to leave the class prior to the end of the period, etc. Disruptive students will be asked to leave the class. Repeat offenders may be withdrawn.

Use of Laptops in the Classroom: You are only permitted to use a laptop during class to take notes, as long as you do not disturb your neighbors. Many of the notes in this class, however, will involve sketches, so a laptop may not be the best way to take notes. Laptops may not be used during class time to answer email, browse the web, listen to music, or any other activity not related to class. **If you are using your laptop for one of these unauthorized activities**, **you will lose all credit for in-class points earned to that point**. The teaching assistant, will be seated at the back of the class, may simply note who you are and contact you after class rather than interrupting the class to notify you. If you are disrupting other students you will be asked to leave the lecture hall.

Disability Accommodation
Qualified students with disabilities who will require disability accommodations in this class will need to make their requests to me at the beginning of the semester either during office hours or by appointment. **Note:** *Prior to receiving disability accommodations, verification of eligibility from the Disability Resource Center (DRC) is required. Disability information is confidential.*

Establishing Eligibility for Disability Accommodations
Students who feel they will need disability accommodations in this class but have not registered with the Disability Resource Center (DRC) should contact DRC immediately. Their office is located on the first floor of the Matthews Center Building. DRC staff can also be reached at: 480-965-1234 (V), 480-965-9000 (TTY). For additional information, visit: www.asu.edu/studentaffairs/ed/drc. Their hours are 8:00 AM to 5:00 PM, Monday through Friday.

Audio/Visual Recording

Neither audio nor video recording will be permitted except under special circumstances prescribed by the ASU Disability Resource Center (DRC). You are also not allowed to use the camera in your phone to record pictures or video, without expressed consent of the instructor.

Harassment

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources athttps://sexualviolenceprevention.asu.edu/faqs. As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling, is available if you wish discuss any concerns confidentially and privately.

Drop and Add Dates/Withdrawals

This course adheres to a compressed schedule and may be part of a sequenced program, therefore, there is a limited timeline to drop or add the course. Consult with your academic advisor and notify your instructor to add or drop this course. If you are considering a withdrawal, review the following ASU policies: Withdrawal from Classes, Medical/Compassionate Withdrawal, and a Grade of Incomplete. Please consult the advisor before dropping the course. There are often suggestions for improvement that you might not have considered.

This course adheres to a compressed schedule and may be part of a sequenced program, therefore, there is a limited timeline to drop or add the course. Consult with your academic advisor and notify your instructor to add or drop this course. If you are considering a withdrawal, review the following ASU policies: Withdrawal from Classes, Medical/Compassionate Withdrawal, and a Grade of Incomplete. Please consult the advisor before dropping the course. There are often suggestions for improvement that you might not have considered.

GLG110 Example Schedule

Schedule for GLG110

Lecture Units #	Week of (Monday)	Chapters Covered:	Key Topics:	Due Fridays Journals/In-class/ Midterm
	Aug. 23	Course Introduction, Syllabus, Expectations, and How to Succeed		
#1	1 – Aug. 26 Drop Deadline (Wed.Aug 28th)	Ch01: Introduction to Natural Hazards	-Hazard, disaster, catastrophe -Biogeochemical cycles Scientific Method, Prediction vs. Forecasting -5 Fundamental Concepts of Hazards -Frequency vs. magnitude of natural events -Financial and Human Recovery response	1) 5 Fundamental Concepts Homework and in-class discussion 2) Ch01 Journal Entry
#2	2 – Sept. 2 No Monday class (Labor Day)	Ch09: Energy and Severe Weather	-Electromagnetic and Geothermal Energy -Energy Transfer -Atmospheric Structure, Pressure, Stability -Coriolis Effect -Circulation (in-class activity) -Case Studies	1) Earth's Orbit (movie quiz)
#3	3 – Sept. 9	*Ch09: continue Severe Weather*	-Weather Fronts -Severe Thunderstorms and Dust Storms -Lightning and Hail -Tordanoes -Case Studies	1) Ch09 Journal Entry
#3	4 – Sept. 16	*Ch09: continue*	-Blizzards, Sleet, Freezing Rain -Heat Waves -Case Studies	1) Ch09: A5FC Question and Discussion
#4	5 – Sept. 23	Ch10: Cyclones	-Cyclone Development, Coriolis revisited -Cyclone Movement -Cyclone Rotation (in class activity) -Computer model Forecasting	1) Old Man and the Storm (movie quiz) 2) Ch10 Journal Entry
#4	6 – Sept. 30	Ch10: Cyclones	-Cyclone Hazards -El Nino/La Nina cycles -Case Studies	1) Ch10: A5FC Question and Discussion 2) Business of Disaster (movie quiz)
#5	7 – Oct. 7	Ch12: Climate Change	-Climate zones -Climate Forcings and Thresholds -Greenhouse Effect	1) Ch12 A5FC Question and Discussion
#5	8 – Oct. 14 No Monday class	*Ch12: continue Climate Change*	-Decadal Oscillations -Climate Change (in-class activity)	Midterm Friday (10/18) Chps. 1,9,10, & 12 -Ch12 Journal Entry
#6	9 – Oct. 21	Ch02: Earth Structure / Plate Tectonics	-Earth Compositional and Rheologic layers -Rock Convection -Earthquake and volcano distribution -Plates / Hot spots / Historical Geology -Plate Tectonic (in-class activity)	1) Ch02 Journal Entry
#7	10 – Oct. 28	Ch03: Earthquakes	-Fault types -Earthquake cycle -Earthquake (in-class activity)Units	1) Earth's Deadliest Quakes (movie quiz)
#7	11 – Nov.	*Ch03: continue Earthquakes*	-Magnitude scales -Earthquake Hazards and Geography	1) Ch03: A5FC Question and Discussion

GLG110 Example Schedule

#7	4 Withdrawal deadline		-Case Studies	2) Ch03 Journal Entry
#8	12 – Nov. 11 No Monday Class (VD)	Ch05: Volcanoes	-Melting processes -Magma properties -Volcano types and geography	1) In the Path of a Killer Volcano (movie quiz)
#8	13 – Nov. 18	*Ch05: continue Volcanoes*	-Volcanic Eruption Index -Volcanic Hazards and Mitigation -	1) Ch05: A5FC Question and Discussion 2) Journal Entry
#9	14 – Nov. 25 No Friday class (Turkey)	Ch06: Flooding	-River characteristics and zones -Geography -Flash floods vs. Downstream floods -Flooding (in class activity) -Case Studies	1) Ch06: A5FC Question and Discussion 2) The Great Flood (movie quiz) 3) Ch06 Journal Entry
#10	15 – Dec. 2	Ch07: Mass Wasting	-Types of mass movement -Forces acting on slopes -Effects of Water, Climate, Topography and Vegetation -Mitigation	1) Ch07: A5FC Question and Discussion 2) Ch07 Journal Entry
	Finals Week		**Final:** Wednesday (12/11) 9:50 – 11:40 am	(Chps. 2,3, 5, 6 & 7)

GLG 111: Dangerous World Laboratory (online)
2019 Spring Session B Syllabus

NOTE: THIS IS A SEPARATE COURSE FROM GLG 110. If you are also enrolled in GLG110 this semester, please note that you will be receiving a separate grade for each course.

Natural Sciences General Studies: Both GLG 110 and GLG111 are required to secure Natural Sciences General Studies (SG) credit. **However, the classes do not have to be taken simultaneously.**

Instructor Information

Professor Prof. AB Clarke Email clarke.glg110@asu.edu
TA Rachel Bruyere Email bruyere.glg110@asu.edu

Please use the course discussion board to ask questions or you may email me at the address above. Please use an appropriately descriptive subject line and **a polite and professional tone, addressing me as Prof. Clarke. Inappropriate emails will be ignored. Do not send emails to my ordinary ASU address because they will be lost in a sea of other emails.** If further discussion is required, a video chat can be arranged.

Course Overview

Using natural disasters as a focus, you will develop a basic understanding of the physical nature of the Earth and the natural processes that may cause widespread death, damage and destruction. You will use laboratory exercises to examine natural events from a scientific perspective to understand what they are, why, when, and where they occur, and what hazards they present. Then you will consider who is at risk from such hazards and what, if anything, can be done to reduce their vulnerability.

Learning Outcomes

By completing this course, you will be able to:

- Think and work like a scientist
- Recognize how scientists think and learn about Earth
- Gain practical, quantitative knowledge of natural hazards
- Appreciate the vulnerability of humans to natural hazards
- Recognize that science is fun, interesting, and relevant to your life

Required Material

This is an online course. To successfully complete this course, you will need to view and complete the labs through an online interface. You can purchase access cards directly from the publisher here: https://he.kendallhunt.com/product/dangerous-world-laboratory. This is a relatively new online interface, so I ask for your patience.

1. For technical assistance, please click **web support** or **plugins** at the bottom of the lab page.

2. For content or grading oriented questions, please use the discussion board or use the email address above. **Do not send emails to my ordinary ASU address.**

Online Labs

There are 11 labs for this course. You will complete them through the online interface, access to which you must purchase. In general, I recommend the following approach:

Step 1: View my video introduction to the lab. I have created a YouTube playlist containing videos with overviews and tips and pointers.

Step 2: Download or play the video lecture in the browser. The pace is fast, so I recommend pausing the presentation periodically to read the full content at your own pace. These lectures have no audio.

Step 3: Visit and read any recommended links below the video. Keep those tabs open for later use.

Step 4: Go to the Reading tab, if there is one. Read the information and case study. Complete any activities or calculations required. Take notes on those activities and save your files.

Step 5: Go to the Exercise tab. You will have two attempts at each exercise and there is no time limit. Be sure to save each answer before moving to the next question.

On average, it will take you about 2.5 hours to complete each lab, although the first two to three labs are much less time-consuming than the others, so do not be lulled into a false sense of security.

While completing the labs, you must submit your own answers based on your own analysis or calculations. You may discuss it with other students in the class. The feedback between the two attempts is designed to help you increase your score on the next attempt. On your final attempt make sure you are confident in your answers before you submit your work.

Grade Policy

The final grade scale will be based on the standard scale: A 90-100%, B 80-89%, C 70-79%, D 60-69%. Below a 60% will result in an E for the class.

% of pts. possible	Grade
90 -100%	A
80-89%	B
70-79%	C
60-69%	D
<60%	E

Computer Requirements

You will need to have access to and be able to use the following software packages:

- A web browser (Mozilla Firefox, Google Chrome, Apple Safari).
- Appropriate plug-ins. If you have issues viewing any content, you can contact technical support by clicking **web support** or **plug-ins** at the bottom of the online interface once you have access.

You will also use the following software packages for some labs. Links and specific instructions will be provided within those labs.

- Microsoft Excel, OpenOffice Spreadsheet, or other application that can calculate values and plot them.
- Google Earth Pro (free download for all platforms at https://www.google.com/earth/versions/#download-pro)

Drop and Add Dates/Withdrawals

This course adheres to a compressed schedule and may be part of a sequenced program, therefore, there is a limited timeline to drop or add the course. Consult with your academic advisor and notify your instructor to add or drop this course. If you are considering a withdrawal, review the following ASU policies: Withdrawal from Classes, Medical/Compassionate Withdrawal, and a Grade of Incomplete. Please consult the advisor before dropping the course. There are often suggestions for improvement that you might not have considered.

Grade Appeals

Grade disputes must first be addressed by discussing the situation with the instructor. If the dispute is not resolved with the instructor, the student may appeal to the department chair per the University Policy for Student Appeal Procedures on Grades.

Student Conduct and Academic Integrity

Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information,
see http://provost.asu.edu/academicintegrity. Additionally, required behavior standards are listed in the Student Code of Conduct and Student Disciplinary Procedures, Computer, Internet, and Electronic Communications policy, and outlined by the Office of Student Rights & Responsibilities. Anyone in violation of these policies is subject to sanctions.

Students are entitled to receive instruction free from interference by other members of the class. An instructor may withdraw a student from the course when the student's behavior disrupts the educational process per Instructor Withdrawal of a Student for Disruptive Classroom Behavior.

Appropriate online behavior (also knows as *netiquette*) is defined by the instructor and includes keeping course discussion posts focused on the assigned topics. Students must maintain a cordial atmosphere and use tact in expressing differences of opinion. Inappropriate discussion board posts may be deleted by the instructor.

The Office of Student Rights and Responsibilities accepts incident reports from students, faculty, staff, or other persons who believe that a student or a student organization may have violated the Student Code of Conduct.

Copyright Information

All the content in this course, including lectures, are copyrighted materials. Students may not share outside the class, upload, sell or distribute course content or notes taken during the conduct of the course (see ACD 304-06). Students may not upload to any course shell, discussion board or website used by the course instructor or other course forum, material that is not the student's original work, unless the student first complies with all applicable copyright laws. The instructor reserves the right to delete materials on the grounds of suspected copyright infringement (see ACD 304-10).

Prohibition of Commercial Note Taking Services

In accordance with ACD 304-06 Commercial Note Taking Services, written permission must be secured from the official instructor of the class in order to sell the instructor's oral communication in the form of notes. Notes must have the notetaker's name as well as the instructor's name, the course number, and the date.

Course Evaluation

Students are expected to complete the course evaluation. The feedback provides valuable information to the instructor and the college and is used to improve student learning. Students are notified when the online evaluation form is available.

Syllabus Disclaimer

The syllabus is a statement of intent and serves as an implicit agreement between the instructor and the student. Every effort will be made to avoid changing the course schedule but the possibility exists that unforeseen events will make syllabus changes necessary. Please remember to check your ASU email and the course site often.

Accessibility Statement

In compliance with the Rehabilitation Act of 1973, Section 504, and the Americans with Disabilities Act as amended (ADAAA) of 2008, professional disability specialists and support staff at the Disability Resource Center (DRC) facilitate a comprehensive range of academic support services and accommodations for qualified students with disabilities.

Qualified students with disabilities may be eligible to receive academic support services and accommodations. Eligibility is based on qualifying disability documentation and assessment of individual need. Students who believe they have a current and essential need for disability accommodations are responsible for requesting accommodations and providing qualifying documentation to the DRC. Every effort is made to provide reasonable accommodations for qualified students with disabilities.

Qualified students who wish to request an accommodation for a disability should contact the DRC by going to https://eoss.asu.edu/drc, calling (480) 965-1234 or emailing DRC@asu.edu. To speak with a specific office, please use the following information:

Tempe Campus

480-965-1234 (Voice)

Title IX

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqs.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling, is available if you wish discuss any concerns confidentially and privately.

GLG111 Example Schedule

Dangerous Worlds Lab GLG111

Lab #	Key Topics:
1: Introduction	1) Use of government websites and resources to gather information about hazards
2: Reading Maps	1) Understand and use topographic maps 2) Understand and use geologic maps
3: Rock Record	1) Understand rock formation 2) Understand relative dating techniques for analysis of the rock record 3) Understand Stratigraphic analysis for interpreting the rock record
4: Using Google Earth to Investigate Natural Hazards	1) Interpret Earth topography at various scales 2) Extract spatial information to quantify impacts of past geologic and atmospheric events. 3) Quantify human and environmental recovery from past events through time
5: Plate Tectonic Process and Hazards	1) Use current government spatial data to conduct time-series analysis of plate movement. 2) Interpret time-series data to evaluate consequences of tectonic activity
6: Earthquake and Tsunami Hazards	1) Calculate earthquake locations from seismic data 2) Evaluate earthquake dynamics and consequences to human infrastructure for different seismic events using government data 3) Evaluate different natural processes linked to specific earthquake events 4) Map tsunami inundation and effects using topographic maps and Google Earth
7: Volcanic Hazards	1) Evaluate various volcanic hazards from different volcanic processes (e.g., ash fall and flow, lahars, dome collapse) 2) Review government reports regarding past and on-going volcanic activity 3) Evaluate volcanic activity by quantifying changes in Earths surface driven by volcanic processes
8: Climate and Earth System Change	1) Use current ice retreat data from Greenland to quantify rates and processes of deglaciation 2) Compare and Contrast polar deglaciation results with mid-latitude changes in climate 3) Investigate climate effects from explosive volcanic eruptions and contribution of volcanic gasses to the atmosphere
9: Extraterrestrial Impacts and Mass Extinctions	1) Evaluate correlation between known impact events and mass extinction events. 2) Evaluate how the hazard posed to global population scales with size of impactor
10: Mass Wasting	1) Understand the mechanics of different types of slope failure 2) Evaluate correlation between precipitation and slope failure 3) Quantify landslide scales and evaluate potential triggers
11: Severe Weather	1) Evaluate the physical and societal risk of severe weather 2) Understand process and challenges of governmental warning systems 3) Understand the mechanical and chemical processes of severe weather

FIFTH EDITION

NATURAL HAZARDS

EARTH'S PROCESSES AS HAZARDS, DISASTERS, AND CATASTROPHES

EDWARD A. KELLER AND
DUANE E. DeVECCHIO
WITH ASSISTANCE FROM
ROBERT H. BLODGETT

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

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