Proposal for a General Education Learning Community (Cluster)

Earth Crisis!

April 4th, 2014

1. Theme and Relevance

The theme for our mixed cluster covering GE areas B1 (physical science), B3 (science elective), and D (social science) will be the critical analysis of environmental issues and problems, from scientific and social perspectives, and from global to local scales. The name of our cluster will be "Earth Crisis!". We believe this theme will speak to our freshmen because of the pervasiveness of environmental issues in popular media including blogs on the internet, movies, music, radio, and television. Environmental problems are increasingly affecting all aspects of life, including all aspects of human society. Global warming and sea-level rise have become topics of everyday discussion. The lack of understanding by the American public of the social and scientific implications of environmental crises is alarming. By the middle of the century, sea level rise is projected to have a major impact on infrastructure along the margins of San Francisco Bay, including both the San Francisco and Oakland airports. We explore this and other topics that have the potential to directly affect people living in the Bay Area, especially earthquakes, landslides, floods, and tsunamis. Students will have an opportunity to examine the potential effects of earth crises on our everyday lives.

2. Courses

- GEOL 2301 - Natural Hazards (4) (revised existing course, approved for Area B1 Physical Science)
- ENVT 2001 - Environmental Perspectives (4) (revised existing course, approved for Area D)
- ENSC 2802 - California Environmental Crises (4) (revised existing course, approved for Area B Science elective)

3. Integration of Course Content

During Fall quarter, students will learn about the science behind natural disasters in GEOL 2301. In this Physical Science GE course, students will learn about the earth processes that lead to catastrophic events such as earthquakes, volcanoes, hurricanes, floods, landslides, tsunamis. They will learn how certain human activities may exacerbate the impact of natural physical events. In ENVT 2001 during Winter Quarter, students will apply social science methodologies to further investigate the natural phenomena explored during Fall quarter and explore their effects on humans societies and social structures.

One example of how the content of GEOL 2301 and ENVT 2001 may be integrated is in the physical causes and human impact of earthquakes. Students will learn about the geological processes that result in earthquakes, and then why a major earthquake would tend to cause a much higher level of casualties in a developing nation like Haiti than in a more developed nation.
like Chile. Students will also learn that the impact of a natural disaster in a developing nation is generally measured in terms of loss of human lives, whereas in a developed nation it is measured in terms of economic and environmental impact. During Spring quarter, in ENSC 2802, the students will integrate aspects of the science and social science they explored during Fall and Winter, and explore the life science aspects of environmental science, and apply the integrated knowledge to investigations of major California environmental problems.

4. Learning Outcomes and General Education Requirements

ENSC 2802, GEOL 2301 and ENVT 2001 have previously been accepted for GE credit. Current and newly modified GE approval forms are attached.

5. Course Outlines and Integrative Activities

The first course in this cluster, GEOL 2301 (Natural Hazards), will introduce the students to physical earth processes and how the scientific method is applied to studying such processes. In the second course, ENVT 2001 (Environmental Perspectives), students will continue to examine the environmental phenomena introduced during Fall Quarter, but with an emphasis on the sociological and societal effects of these natural disasters. In the third course, ENSC 2802 (Global Environmental Issues), students will apply the general social science and science knowledge gained in the first two classes to investigations of environmental issues specific to California.

Course syllabi are attached.
Earth Crisis Cluster Proposal

Approved by Department Chairs:

Mitchell Craig
Earth & Environmental Science
Department

Signature

David Forsor
AGES: Anthropology, Geography & Environmental Studies
Department

Signature

Signature

Department

Date

4/3/2014

Approved by College Dean/Associate Dean from each participating college

Alan Marcott

Signature

Date

4/3/14

Signatures of three faculty members: Ideally, the person who will teach the courses will participate in the cluster planning. However, recognizing the staffing difficulties departments face, the faculty member who plans the cluster must agree to provide a thorough orientation to the expectations and methods developed for the learning community to the actual instructor. If monies are available, faculty should be available for meetings in the late spring to plan integration points in the yearlong curriculum.

Luther Strayer (Chair, EESE)

Signature

Date

4/3/2014

David Woe (signed by Mitchell Craig)

Signature

Date

4/3/2014

(Chair, AGES)

David Forsor

(Chair, EESE)

Signature

Signature

Date

4/4/14

Proposals should be submitted as soon as possible and no later than Friday, April 4, 2014. Please submit proposals to sally.murphy@csueastbay.edu and linda.beebe@csueastbay.edu.

*While Colleges do not approve courses for GE, College approval assures support for departmental participation.*
Application for General Education Credit
for Lower Division Science Elective (Area B3)

Course title: Global Environmental Issues  
Course number: ENSC 2801

Note: This course was originally approved for GE Area B3 credit as ENSC 2800. ENSC 2801 is a cluster-specific version of ENSC 2800. This document uses the current GE course proposal form to explain how this course addresses learning outcomes.

Courses approved for general education credit must provide students with explicit instruction in the approved student learning outcomes. Please be as specific as possible, pointing to topics, readings, assignments, activities and assessments that illustrate how the course meets the requirements. Attach the course syllabus and any assignments or assessments needed to support your explanations.

Please use this template as a guide to address ALL of the following learning outcomes.

Purpose of Science GE: The goal of lower division general education in the natural sciences is to gain basic knowledge and learn key principles in the life and physical sciences as essential for an informed citizenry. In addition, students should recognize the experimental and empirical methodologies characteristic of science and understand the modern methods and tools used in scientific inquiry.

1. Students will demonstrate a broad science content knowledge in the physical, life, or interdisciplinary sciences.

This course is designed to be a vehicle for integrating a range of science skills and knowledge into an examination of critical science-based issues that affect the lives of CSUEB students as well as all Californians. Students are given an opportunity to apply the knowledge they have gained and further the interests they have and will acquire in other science classes by studying, evaluating and communicating to their professor and peers the nature, significance and potential solutions to ongoing or predicted environmental problems in the state. Through class instruction and through individual guided research, each student will develop a more profound knowledge of the natural sciences and how the physical and biological components interact with other non-science areas to create the multifaceted environmental problems faced by this increasingly populated state. This class will provide a broad based education in the natural sciences as well as a balanced exposure to the application of both the life and physical sciences through the examination of environmental problems. Environmental issues will form the backdrop for an interdisciplinary examination of science topics.

2. Students will demonstrate the application of quantitative skills (such as statistics, mathematics, the interpretation of graphical data, etc.) to scientific problems.

Students will be required to apply quantitative skills to the analysis of such diverse topics as population growth, nuclear energy, background extinction rates, and water quality. They will be asked to examine relationships between different facets of information, for example, the comparison between increase in atmospheric carbon dioxide levels and changes in climate. As
another example, students will learn about the First and Second Laws of Thermodynamics and learn to apply these laws in their interpretations of how energy is used efficiently and inefficiently (e.g., Did you know that only about 20% of the high-quality energy in gasoline is transformed into usable mechanical and electrical energy by the typical automobile?). Quantitative analysis of graphical, statistical, and mathematical information will be stressed throughout the class, both in class instruction and in the student analysis and presentation of research topics. Students must clearly demonstrate the application of quantitative skills including the ability to understand and perform statistical and mathematical procedures and interpret tabular and graphical data ranging from histograms and scatterplots to maps and Venn diagrams.

3. Students will demonstrate a general understanding of the nature of science, the methods applied in scientific investigations, and the value of those methods in developing a rigorous understanding of the physical world. Students should be able to identify the difference between science and other fields of knowledge. Students should be able to distinguish science from pseudoscience.

Students will develop a clearer understanding of the complex nature of a range of important environmental issues through the examination of scientific methods of investigation and discussions of topics that constitute science vs. pseudoscience. As an example, topics to be discussed will include evolution, the scientific evidence in support of evolution, and scientific methods for studying evolution. We will also examine physical earth processes such as plate tectonics, and will discuss evidence for continental drift with its effects on the biogeography of different groups of organisms. We will require students to conduct thematic research projects to evaluate the information available about the scientific basis and implications of different California environmental problems. Students will learn to identify, assess and synthesize a wide array of information from different sources and data types to arrive at a clear understanding of a topic about which they had only limited prior knowledge.
Note: This course was originally approved for GE Area D credit as ENV 2000. ENV 2001 is a cluster-specific version of ENV 2000. This document uses the current GE course proposal form to explain how this course addresses learning outcomes.

Maximum enrollment: To be determined based on number of students in cluster.

Courses approved for general education credit must provide students with explicit instruction in the approved student learning outcomes. Please be as specific as possible in your explanations, describing topics, readings, assignments, activities and assessments that illustrate how the course supports students' acquisition of the learning outcomes. Remember, there may be no one on the review committees who has any knowledge of your discipline. Attach the course syllabus and any assignments and/or assessments needed to support your explanations.

Please use this template to address ALL of the following learning outcomes.

Courses in this area acquaint students with fundamental principles and methods of inquiry, theoretical problems, and applications grounded in social science disciplines whose field of study is human behavior in its social environment.

ENV 2001 supports student acquisition of knowledge and skills described in the lower division "GE Social Science Outcomes". Specifically, this class supports items number 1, 3, and 5, as described below.

1. Students will demonstrate, orally and in writing, recognition of the application of disciplinary concepts derived from at least three social or behavioral sciences in the study of human behavior, individually and in society.

ENV 2001 introduces how behaviors of human beings and human society make changes to our living environment consequently how such changes of environment influences our own well being, our economic development, and our society's sustainable future. Students learn theories of ecosystem conservation, models of sustainable ecosystems. They learn, through their exams and essays, to use these theories and models to compare with human society and economic system. They also learn the practical applications of environmental conservation to urban development, forest and rangeland management, aquatic ecosystem protection.

2. Students will demonstrate, orally and in writing, recognition of the inquiry methods used by at least one of the social or behavioral science disciplines.

ENV 2001 introduces how behaviors of human beings and human society make changes to our living environment consequently how such changes of environment influences our own well being, our economic development, and our society's sustainable future. Students learn theories of ecosystem conservation, models of sustainable ecosystems.
They learn, through their exams and essays, to use these theories and models to compare with human society and economic system. They also learn the practical applications of environmental conservation to urban development, forest and rangeland management, aquatic ecosystem protection.

3. Students will demonstrate, orally and in writing, the ability to describe how human diversity and the diversity of human societies influence our understanding of human behavior, individually and in societies, both local and global

ENVT 2001 demonstrates that human beings had become the super-power in natural, surpassing all other agents in the natural in shaping our living environment. Students learn that individual behavior plays an important role in environment protection and natural resource conservation. Through their essay pages, these concept will be engraved in their minds which will serve as an important principal in guiding their person behavior in their future lives.

5. Students will demonstrate, orally and in writing, the ability to describe major positions and contrasting arguments made on one or more significant contemporary issue area confronting US society as applied to human behavior. (Possible areas include: biomedical and health issues, class, crime, discrimination, education, energy, environment, gender, global economy, immigration, military intervention abroad, poverty, race, technology.)

ENVT 2001 spends a good portion of time in discussing our energy and environment issues. Air pollution, water pollution, and global warming derived from fossil fuels consumption have given serious challenges to human being's development. Whether the technology can solve these problems in the short or long run remains to be discussed. Students learn that the U.S. can play a pivotal role in dealing with environmental changes that the world is facing.
GEOL2301 - Natural Hazards - Spring 2013
Department of Earth & Environmental Sciences
California State University, East Bay

Instructor: Dr. Luther M. Strayer
Office: 353 N. Science Building
Phone: (510) 885-3083 - Use email as first contact method - it is most effective because of robo-calls. Call the Department of E&ESci office if you have an emergency and leave a message with the Dept. Secretary at (510) 885-3486 and I will be contacted.
email: luther.strayer@csueastbay.edu
Office Hours: W & Th 12:30-2:00 pm, and by appointment.

Lecture Section: M & W 2:00 - 3:50am

!Warning! A used custom version of Abbott, 8th Edition (ISBN 0077572378) may be available. It is mostly current and useful, except that it may be missing 2 or so chapters. Be Warned!

Course Description: Geologic processes and their effects on human populations. Topics include earthquakes, landslides, volcanic eruptions, coastal erosion, floods, atmospheric and water pollution. Designed for Physical Science G.E. students.

Learning Outcomes and Objectives: A firm understanding of the nature and causes of destructive natural phenomena, specifically, but limited to:
2) Plate tectonics – the fundamental and underlying theory that accounts for and predicts all geologically-driven systems and drives earthquakes and volcanoes and gravitationally-driven events.
3) Geologic Time – an appreciation for the incredible magnitude of geologic time and its importance in natural phenomena.
4) Solar-driven phenomena – weather and climate-related hazards, global-climate change and related fires and flooding.
5) Understand the fundamental difference between hazard and risk, and how to mitigate risk. Understanding the very real nature of the risks associated with living in the San Francisco Bay Area.

Course Requirements: Mid-Term1 (25%); Mid-Term2 (30%); Final Exam (30%); GCC Project (15%)
- Final Exam will be mildly cumulative, recalling the major points of some previous material.
- Attendance will be taken randomly but especially on days when attendance is poor. So show up – you’re paying for it! Maximum of 10 points will be taken off your final grade for missing 5 or more random attendance counts – one miss is worth 2 points on your final grade.
- Extra Credit is available if you complete the Global Climate Change project – doing an excellent job - above and beyond! - on your project it will be worth a maximum of 5 points toward your final grade.
Grading: I do not ‘curve’ individual exams, but rather I make any adjustments only after I have calculated the final exam. I use the standard 100-90 = A, 80-89 = B, etc. grade scheme.

Global Climate Change Open Format eProject: You will turn in a project designed to illustrate your scientific understanding of the very important problem of Global Climate Change (GCC). GCC is a topic that we cover in only one chapter in this course, but it is the single most important issue that faces mankind, and as such, we will be discussing GCC concepts all quarter long. Therefore, I expect you to embark on a self-study of GCC outside of our classroom, the result of which will be your project submission to me.

The format of this project is open ended, but I expect it to represent about 10 hours of your homework time (which is not a lot, you must admit...), and it must be able to be submitted to me electronically, and you must have some fun with it!

This quarter I am requiring that your project be turned in in only one of 2 formats:

1) A standard research paper (10 or so pages double-spaced, 5 figs max, including references), and;
2) A YouTube video focused on some important aspect of global climate change. This can be a narrative (story), documentary, talk-show, drama, stand-up routine, etc. Who knows – you could get famous!

There must be a large number of other creative ways to get across to me what you have learned on your own. Put the time into it because I expect something good and it is 15% of your grade – you can’t do well in this course if you don’t do a good job here. I will provide a simple grading rubric that will allow you to know what I am looking for by week 2. Keep things clear and succinct. Movies, etc. should ideally be limited to 5-10 minutes in length.

Exams: will be in multiple choice, true/false and short-answer format with or without extra credit (my choice) and may be mildly cumulative – stressing important and fundamental concepts. Exams will stress material covered in class, but may include any material in the textbook. Extra credit questions are often derived from current events in the Earth Sciences or a concept or topic that I heavily emphasize prior to the exam. Therefore you should make a point of actually looking at the emails I might send that point you to an article or current story, as these are often the subject of juicy extra credit questions. Exams may be taken on green scantron forms, which students supply and instructor will indicate exam format at least one class prior to exam. Bring a green scantron form just in case!

Extra Credit: will be gained by doing extraordinary work on your GCC Open Format eProject. A total of 5 points added to your final, calculated course grade.

Recording Lectures: There will be no recording of lectures without my permission. University policy is that students must get the explicit permission of the instructor and class in order to record either sound or video in class.

No open laptop computer or smartphone use unless you have a formal accommodation through the University Accessibility Services (see below). Note taking by hand is a valuable skill and this is a place for you to practice. I will ask you to leave if you do not honor this policy.
Accommodation of Students with Disabilities: Accessibility Services provides academic accommodations to qualified students with disabilities. Counselors determine accommodations on an individual basis after reviewing current professional documentation and meeting with the student. The purpose of such accommodations is to provide equal access to classroom programs and campus activities in a manner consistent with Section 504 of the Rehabilitation Act, the Americans with Disabilities Act, associated California laws and regulations, and CSU policy. http://www20.csueastbay.edu/af/departments/as/

Schedule (Always Subject To Revision) Dates of exams are firm. Material covered will depend on class progress.

<table>
<thead>
<tr>
<th>Week</th>
<th>Ch. 2 Internal Energy &amp; Plate Tectonics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Ch. 2 Internal Energy &amp; Plate Tectonics / Ch. 3 EQ Geology &amp; Seismology</td>
</tr>
<tr>
<td>Week 2</td>
<td>Ch. 3 EQ Geology &amp; Seismology / Ch. 4 Plate Tectonics and EQ's</td>
</tr>
<tr>
<td>Week 3</td>
<td>Ch. 5 EQ Lessons &amp; Regions</td>
</tr>
<tr>
<td>Week 4</td>
<td>MID-TERM EXAMINATION #1 Chapts. 2–5 - Wednesday</td>
</tr>
<tr>
<td>Week 5</td>
<td>Ch. 6 Plate Tectonics and Magma</td>
</tr>
<tr>
<td>Week 6</td>
<td>Ch. 6 Plate Tectonics and Magma / Ch. 7 Volcano Case Histories</td>
</tr>
<tr>
<td>Week 7</td>
<td>Ch. 8 Tsunami / Ch. 9 External Energy: Wind &amp; Climate</td>
</tr>
<tr>
<td>Week 8</td>
<td>Monday off (Memorial Day)</td>
</tr>
<tr>
<td>Week 9</td>
<td>MID-TERM EXAMINATION #2 Chapts. 6–9 - Wednesday</td>
</tr>
<tr>
<td>Week 10</td>
<td>Ch. 10 Tornados, Lightning, Heat &amp; Cold / Ch. 11 Hurricanes</td>
</tr>
<tr>
<td>FinalsWeek</td>
<td>Ch. 15 Mass Movements; Ch. 17 Impacts with Space Objects</td>
</tr>
<tr>
<td>FinalsWeek</td>
<td>FINAL EXAM Chapts. 10-11, 15 &amp; 17</td>
</tr>
</tbody>
</table>

Final Exam: The exam will be somewhat cumulative, but will emphasize material covered since the second mid-term exam. You are responsible for looking up the exam date and being there on time! http://www20.csueastbay.edu/students/academic-and-studying finals/spring.html
Dept. of AGES  
California State University, East Bay  
Winter Quarter, 2014

Email: david.woo@csueastbay.edu

**ENVT 2001: ENVIRONMENTAL PERSPECTIVES**  
MW 2:00-3:50pm; MI 2064 (4 units)  
**Dr. David Woo:** RO206  
office hrs.: M & W 12:30-2:00pm  
office phone: (510) 885 – 3160

---

**Required Text:**

No textbook is required. Lecture materials will be uploaded on Blackboard for students to access before classes.

**Course Objectives and Learning Outcome:**

This course is designed to present the basic concepts of the global human environment: problems and issues, including ecosystem imbalance, human population explosion, global food supply and energy issues, air and water pollution, solid and hazardous waste disposal, and climate change. The discussion will focus in four major areas: 1) **natural ecosystems, biodiversity, and sustainable development;** 2) **human population issues;** 3) **energy, renewable and non-renewable natural resources;** and 4) **environmental pollution and prevention.** This course has no intention to define the rules of environmental management. It is designed to give students an essence of current environmental concerns on human utilization and exploitation of natural resources.

**Course Policies:**

By enrolling in this class, the student agrees to uphold the standards of academic integrity described at http://www20.csueastbay.edu/academic/academic-policies/academic-dishonesty.html.

The student is expected to attend all classes.

There will be one mid-term exam (45%) and one final exam (45%). The remaining 10% of the grade comes from class attendance and participation. The final exam is “comprehensive” in nature, although the focus will be on course materials covered after the midterm examination. Exam study guides will be posted on Blackboard one week before the exams.

Except in documented medical emergency, there will be no make-up test or extra credit in this course. Under special circumstances, student may apply for an "Incomplete" grade at the end of the course. Those who want to do so must seek permissions from the instructor and complete the necessary paperwork BEFORE the final exam date. No electronic devices are permitted during exams.

This course is NOT open to students who have taken ENVT2000.

**Student Learning Outcomes:**

- Students will learn the essential building blocks of ecosystems and the fundamental laws that govern the interactions among actors in the ecosystem.
- Students will have a better understanding of the spatial aspect of human distribution and migration in relation to the natural health of planet Earth.
• Students will expose to the concept of environmental sustainability in relation to 
resource management, food production, and economic activities.
• Students will study the human impact to the natural environment in terms of air and 
water pollutions.

Accommodations for students with disabilities:

If you have a documented disability and wish to discuss academic accommodations, or if 
you would need assistance in the event of an emergency evacuation, please contact me as 
soon as possible. Students with disabilities needing accommodation should speak with the 
Accessibility Services.

Emergency information:

California State University, East Bay is committed to being a safe and caring community. 
Your appropriate response in the event of an emergency can help save lives. Information on 
what to do in an emergency situation (earthquake, electrical outage, fire, extreme heat, severe 
storm, hazardous materials, terrorist attack) may be found at: 
http://www20.csueastbay.edu/af/departments/risk-management/ehs/emergency-
management/index.html
Please be familiar with these procedures. Information on this page is updated as required. 
Please review the information on a regular basis.

Tentative Course Outline:

Date | Topic(s) of Discussion
--- | ---

Week 1 | Ecological Principles
• Our Troubled Planet
• Changing Environmental Perception
• What is Environmental Sciences
• Themes in Environmental Resource Management

Week 2 | Biochemical Cycles
• Biochemical Cycles and Life
• Material Cycles and Life Processes

Week 3 | Human Population
• Population Dynamics and Definitions
• World Population Growth
• Demographic Transition Model
• Global Population and Food Security

Week 4 | Ecosystems & Biodiversity
• Environments as Ecosystems
• Population and Successions
• Natural Selections and Bio-diversity

**Week 5**.................Biogeography & Biological Productivity
• Species Interactions
• Evolution and Diversity of Biomes
• Island Biogeography
• World Biomes

**Week 6**.................Midterm Exam (Feb. 12\textsuperscript{nd} 2014, Wednesday)

**Week 7**.................Food Supply & Agriculture
• Soils: the Foundations of Agriculture
• World Food Supply and the Environment
• Agricultural Geography
• The Race to Feed the World

**Week 8**.................Water Resource & Pollution
• Water: Supply, Use, and Management
• Water Pollution and Definitions
• Types of Water Pollutants
• Sewage Treatment and Management

**Week 9**.................Air Pollution and Prevention
• Global Climate Change
• Atmospheric Pollution
• Major Air Pollutants and Their Environmental Impacts
• Air Pollution Control and Reduction

**Week 10**.................Energy & Fossil Fuels
• Global Energy Supply and Demand
• Major Fossil Fuels – Oil, Natural Gas, Coal
• Renewable Energy – Wind, Solar, Nuclear, Biomass
• Environmental Impacts and Energy Conservations

**Final Exam**.................March 19\textsuperscript{th} 2014 (Wednesday)
ENSC-2802-01: Global Environmental Issues
Department of Earth and Environmental Sciences
California State University, East Bay
Spring 2014

Syllabus

Instructor: Dr. Gita Dunhill
Office Hours: Mon/Wed 1:00-2:00
Phone: (510) 885-4716
Lecture Schedule: Mon/Wed 2:00-3:50

Office: North Science 351
Email: gita.dunhill@csueastbay.edu
Location: MI #2032


Course Description: In this course we will examine the scientific basis of a wide range of multidisciplinary global environmental problems. This course explores the complex relationships between society and our natural environment by examining the biological, chemical and physical aspects of environmental problems. We will explore how the expanding human population has changed the demand for natural resources both renewable and non-renewable, altered species diversity and ecosystems, and degraded water and air quality throughout the world and California. A portion of the class highlights the impact global climate change is having on our planet including the biological community, oceans and our atmosphere.

In addition to introducing the major environmental problems this class will familiarize the student with the scientific method and the different tools associated with scientific studies such as data interpretation and presentation including graphs and tables. You will learn to evaluate and analyze data and viewpoints that are often conflicting.

Learning Outcomes: Upon completion of this class you will be able to:

- Understand the complex relationship between humans and the environment.
- Comprehend how nature works in terms of basic scientific principles.
- Distinguish between science and pseudoscience.
- Explain the causes and effects of major environmental problems.
- Critically analyze environmental issues through evaluation of scientific literature, and present your positions clearly and persuasively.

Presentation of Material: Lectures are based on general subjects within the text, but are heavily supplemented with additional material from outside scientific resources.

Blackboard Site: I will place viewable files of the lectures on the class's Blackboard site. You will be able to view them and take notes from them. I will also put review sheets, practice exams, and supplementary reading material on the site.

Class Requirements: This class is a four-unit lecture class with two midterm, a final exam, and three or four homework assignments assigned throughout the quarter. The format of the exams will be a combination of multiple choice, short answer and essays. The material will come from the textbook, lectures, and supplementary material.
Your grade will be determined by:

- Midterm #1: 25%
- Midterm #2: 25%
- Homework Assignments: 25%
- Final Exam: 25%

A strict grading scale will be applied.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>94-100</td>
</tr>
<tr>
<td>A-</td>
<td>90-93</td>
</tr>
<tr>
<td>B+</td>
<td>87-89</td>
</tr>
<tr>
<td>B</td>
<td>84-86</td>
</tr>
<tr>
<td>B-</td>
<td>80-83</td>
</tr>
<tr>
<td>C+</td>
<td>77-79</td>
</tr>
<tr>
<td>C</td>
<td>74-76</td>
</tr>
<tr>
<td>C-</td>
<td>73-70</td>
</tr>
<tr>
<td>D+</td>
<td>69-67</td>
</tr>
<tr>
<td>D</td>
<td>66-64</td>
</tr>
<tr>
<td>D-</td>
<td>63-60</td>
</tr>
<tr>
<td>F</td>
<td>0-59</td>
</tr>
</tbody>
</table>

A grade of “incomplete” can only be given if a major portion (> 50%) of the course has been completed at a passing level (“C” or better). If an “I” is assigned, you will have one academic year to complete only the unfinished portion of the course.

**Homework:** Assignments will be due to the beginning of the class on the designated day. Late assignments will be downgraded 10% for each day they are late.

**Extra Credit:** I do not give extra credit assignments. So, please do not ask. A better use of your time is concentrating on the required aspects of the class instead of diverting your effort.

**Make-Up Exams:** Make-up exams are extremely rare. I reserve the right to deny anyone a make-up exam, in which case a zero is recorded. Official documentation is required for any unannounced, unplanned absence. This includes emergency room admittance form with physician signature, police report, death certificate, etc. This will be handled on a case-by-case basis. Make-up exam will be all-essay format.

**Attendance:** The material on the exams will come from lectures, the textbook, and handouts. Attendance is required if you wish to do well in the course. Please feel free to ask questions at any time. Please *do not wait* for a problem to get out of hand before coming to see me.

**Academic Integrity:** By enrolling in this class the student agrees to uphold the standards of academic integrity described in the catalog at: [http://www.csueastbay.edu/ecat/current/i-120grading.html#section12] I take academic honesty very seriously. Plagiarism (cheating) of any sort will not be tolerated. Plagiarism is the use of someone else’s ideas or words as your own. This definition includes copying another student’s exam or assignment as well as using material from a book or internet site without acknowledging the source. If you plagiarize any part of an assignment, you will receive a zero for the entire assignment or exam and disciplinary action will be taken.
**Tips for success in this class:** The whole point of this course is for you to learn something interesting about our environment and our relationship to it. While you’re at it, you might as well perform up to your capabilities. *Everyone* can succeed in this course. Below are some things you can do to help yourself.

1. Take class attendance seriously. Coming to class and paying attention is the single most important thing you can do. Come to every class meeting promptly, stay awake, and pay attention. You’ll be amazed how much easier the class will be.

2. Take notes in class that will help you review before the exams. One strategy that might help is to leave space in the margin of your notes for later comments, while you’re reading or studying. Make your notes concise and well organized. Bring your notes and textbook to class every day.

3. Work a little on this course every day. Spend a few minutes going over your notes after class. Have a look at the assigned reading before coming to that class period and read it seriously after lecture.

4. Most importantly, *take an active role in learning.* Interact with your classmates, ask questions, and try to understand the material as you hear it. Don’t just take notes and say to yourself, “I’ll study that later.” If you don’t understand something, ask a question. Odds are, you’re not the only one with that question.
Lecture Schedule

Note: schedule is likely to change

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Reading</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wed</td>
<td>4/2</td>
<td>1, 2</td>
<td>Introduction, Earth Systems</td>
</tr>
<tr>
<td>2</td>
<td>Mon</td>
<td>4/7</td>
<td>1</td>
<td>Scientific Method: What is pseudo-science?</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>4/9</td>
<td>5</td>
<td>Human Population Growth</td>
</tr>
<tr>
<td>3</td>
<td>Mon</td>
<td>4/14</td>
<td>3, 4, 11</td>
<td>Biodiversity</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>4/16</td>
<td>(Con’t)</td>
<td></td>
</tr>
</tbody>
</table>

**Part 1: Background & Life on Earth**

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Reading</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Mon</td>
<td>4/21</td>
<td>8</td>
<td>Where does our energy come from? Non-renewable Energy</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>4/23</td>
<td>8</td>
<td>Midterm #1 &amp; Fossil Fuels</td>
</tr>
<tr>
<td>5</td>
<td>Mon</td>
<td>4/28</td>
<td>8</td>
<td>Nuclear Energy</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>4/30</td>
<td>8</td>
<td>Renewable Energy</td>
</tr>
<tr>
<td>6</td>
<td>Mon</td>
<td>5/5</td>
<td>7</td>
<td>Food Resources</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>5/7</td>
<td>9</td>
<td>Water Resources</td>
</tr>
<tr>
<td>7</td>
<td>Mon</td>
<td>5/12</td>
<td></td>
<td>Catch up</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>5/14</td>
<td></td>
<td>Midterm #2</td>
</tr>
</tbody>
</table>

**Part 2: Natural Resources**

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Reading</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Mon</td>
<td>5/19</td>
<td>9</td>
<td>Water Pollution</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>5/21</td>
<td>10</td>
<td>Air pollution</td>
</tr>
<tr>
<td>9</td>
<td>Mon</td>
<td>5/26</td>
<td></td>
<td>NO CLASSES – MEMORIAL DAY</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>5/28</td>
<td>14</td>
<td>Is the world getter warmer? Paleoclimate Proxies</td>
</tr>
<tr>
<td>10</td>
<td>Mon</td>
<td>6/2</td>
<td>BB</td>
<td>Short Term Climate Records</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>6/4</td>
<td>BB</td>
<td>Long Term Climate Records</td>
</tr>
</tbody>
</table>

Chapters refer to your textbook and BB indicates readings for that topic will be on Blackboard.

Final Exam: Monday, March 11th, 2:00 – 3:50
Request to apply GEOL 2301 to lower division general education requirements
B1 (Physical Science) and B3 (Science Elective)

Catalog description:
GEOL 2301 Natural Hazards (4)
Earth and human-induced processes and their effects on human populations. Topics include earthquakes, landslides, volcanic eruptions, coastal erosion, floods, severe storms, atmospheric and water pollution. Not for credit in Geology major. Not open to students with credit in GEOL 2300.

Additional Information:
This course gives a broad introduction to the field of geologic hazards with introductions to basic concepts in Physical Geology, Oceanography and Atmospheric Science. GEOL 2301 meets the natural hazards content requirements of the Single Subject Matter Preparation Program in Science for secondary science teachers.

Lower Division Natural Science Learning Outcomes Addressed by this Course:

Physical Science (1) Outcome 1
Students should be able to demonstrate broad science content knowledge in the physical sciences such as the nature and structure of matter, Earth's place in the Universe, or the conservation of energy and matter.

Science Elective (B3) Outcome 1
Students should be able to demonstrate broad science content knowledge in the physical, life or interdisciplinary sciences.

This course examines content in Physical Geology and students will gain knowledge in the following areas:
- Plate tectonics
- Volcanology
- Earthquakes and seismology
- Mass wasting
- Climate change
- Severe storms
- Extraterrestrial impacts

Students will demonstrate their understanding of the content of the course through examinations, homework exercises, and the use of the Internet.

Physical Science and Science Elective (B1 & B3) Outcome 2
Students should be able to demonstrate the application of quantitative skills (such as statistics, mathematics, and the interpretation of numerical graphical data) to (physical) science problems. Students in this course will have the opportunity, in both the lecture and laboratory sections, to interpret graphical data and perform simple numerical calculations. In this course, we will stress
the connection between mathematics and science. It is important that students understand that science is a way of describing the physical world and that we can achieve a deeper understanding through quantitative skills.

Example:
If an isotope has a half-life of 100 years, what percentage of it will remain after 300 years?

This problem may be solved iteratively:

After 100 years, \((0.5)(100\%) = 50\%\) remaining.
After another 100 years (200 years total), \((0.5)(50\%) = 25\%\) remaining.
After another 100 years (300 years total), \((0.5)(25\%) = 12.5\%\) remaining

Alternatively, the problem can be solved simply when the time period is a simple multiple of the half-life:

\[(100\%)(0.5)^3 = 0.125 = 12.5\%\]

This simple example gives us the ability to gain a deeper appreciation of the nature of radioactive decay through a very simple calculation. In addition, this problem reinforces mathematical skills (e.g., iteration, percentages) and science content such as geochronology.

Students in this class will also have the opportunity to interpret graphical data that describe the physical world. For example, they will learn the basic principle of earthquake location by triangulation. In addition, students will learn how to determine the Richter magnitude of an earthquake based on simple measurements from a seismogram. Students will demonstrate their understanding of this learning outcome through examinations, homework exercises, and internet activities.

**Physical Science and Science Elective (B1 & B3) Outcome 3**

Students should be able to demonstrate a general understanding of the nature of science, the methods applied to scientific investigations, and the value of those methods in developing a rigorous understanding of the physical world. Students should be able to identify the difference between science and other fields of knowledge. Students should be able to distinguish science from pseudoscience.

The content of this course includes the analysis of a large amount of scientific observations and data. Examples in class are used to demonstrate the nature of science, empiricism and experimentation. Through this course, students will begin to evaluate scientific data and claims. For example, Wegener’s hypothesis known as Continental Drift will be contrasted with the modern theory of plate tectonics as an example of the scientific method and modern definitions of science. Through these examples, students will gain an appreciation of the methods of science and how science differs from other fields of knowledge and pseudoscience.
Students will demonstrate their understanding of this learning outcome through examinations, homework exercises, and/or web activities.