**OCEANOGRAPHY - GEOLOGY 12**

**M & W, 12:15 am - 1:40 am (Section #34343) – Spring 2016**

**INSTRUCTOR INFORMATION:   
 Instructor: Professor** Sonjia Leyva**Office**: E210G

**E-mail**: [smleyva@pasadena.edu](mailto:smleyva@pasadena.edu) **WEB**: <http://www.geophile.net>

**Office hours**: 1:40 pm – 2:00 pm in the classroom or by appointment

**REQUIRED MATERIALS**:

* Essentials of Oceanography 11/e by Trujillo & Thurman, in addition to handouts & videos.
* Lecture Notes by Sonjia Leyva, available at the bookstore or on Canvas
* Tracing paper (14’x17”), ruler (standard & metric), color pencils, plus other materials (will be discussed in class)
* Account at PCC’s Canvas website

**PURPOSE OF THIS COURSE**

The purpose of this course is to expose you to a broad range of topics in the ocean sciences, familiarize you with scientific methods and terminology, and provide a basic understanding of how the earth works. Whatever profession or vocation you choose, as a citizen and a voter you will have to make decisions concerning problems either directly or indirectly related to the earth sciences, and the oceans in particular.

**STUDENT GOALS**

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

1. Explain the fundamental differences between continents and ocean basins, and explain how ocean basins originate, develop and are destroyed on the basis of plate tectonic models.
2. Know the physiographic subdivisions of the ocean basins and how the characteristics of each are related to plate tectonic, depositional and erosive processes.
3. Be able to explain how the seas originated during the early geologic history of the earth.
4. Know the chemical composition and range of physical properties of seawater and those processes that regulate it.
5. Relate seawater circulation and composition to biological productivity and the distribution of organic life.
6. Explain how horizontal oceanic circulates affects vertical circulation.
7. Understand the coupling between atmospheric and oceanic circulation with respect to wind-driven and geostrophic currents.
8. Explain how waves originate, propagate, and refract and reflect on coastlines to produce longshore currents, littoral drift and depositional-erosional features.
9. Explain how man's engineering structures can impact natural balanced coastal processes.
10. Explain how tides develop and how they are classified.
11. Explain how marine sediments are classified and which chemical and physical principles determine their distribution.

**STUDENT LEARNING OUTCOMES**

In a broader sense, students will finish this class with the following:

1. Knowledge of the scientific method and an ability to apply it in critical evaluation of oceanographic observations and trends in ocean science.
2. A basic knowledge of the evolution, characteristics, and spatial variability of the world’s oceans.
3. An appreciation for mankind’s changing relationship to the oceans.

**METHODS OF EVALUATION, GRADING, ATTENDANCE**:

**Exams** - There will be two exams - one midterm and one final; each exam is worth 100 points. **Make-up exams will be given only to those who can verify a valid excuse for missing an exam**. The make-up will be given at a time that is mutually agreeable to both the student and myself, but must be arranged prior to the initial exam. **Failure to take the make-up exam within two weeks of the original exam date will result in the missed exam counting in as a zero**.

**Weekly Quizzes –** Students are required to log onto Canvas and take a weekly quiz. Each quiz will be worth 20 points and will cover what we have learned (or will learn) in class that week. Students may access the quiz anytime from 8 am Monday through 11:59 pm Sunday. Students may take the quiz only once. Students who do not take the quiz during the allowed time will not be allowed to make up the quiz unless they have an excused absence. **No exceptions!**

**Homework/Activities** - There will be several in-class activities during the course of this class. You are responsible for bringing in the necessary supplies. In addition, you may be responsible for answering a few of the “end-of-chapter” review/critical thinking question. Each assignment is worth 20 - 30 points each. You will be graded on neatness, completeness of activity, and ability to follow directions. **Late work will not be accepted. Students who miss a class due to an unexcused absence will NOT be allowed to make up the work.** Make-up assignments will be given only to those who can verify a valid excuse for missing the assignment. The make-up assignment will given at a time that is mutually agreeable to both the student and myself. **Failure to take the make-up assignment within one week of the original assignment date OR before the last week of class will result in the missed exam//assignment counting in as a zero. All proof of excused absences MUST be shown PRIOR to the student making up the assignment/exam, and MUST be BEFORE the last day of class.**

**Presentations** - Each student will participate in a group presentation to be given in class during the semester. Guidelines and topics for these presentations are outlined on the attached pages. Each presentation is worth 100 points.

**Attendance** - Students are expected to attend each class session and to arrive on time. Funding for this college is based on student attendance, therefore YOU MUST ATTEND CLASS if you wish to get credit for this course. It will be difficult to make up missed class sessions. However, if you miss a class session of valid reasons (illness), it will up to you to make arrangements to complete the activity. **Students who miss a class due to an unexcused absence will NOT be allowed to make up the work.** Make-up assignments will be given only to those who can verify a valid excuse for missing the assignment. The make-up assignment will given at a time that is mutually agreeable to both the student and myself. **Failure to take the make-up assignment within one week of the original assignment date OR before the last week of class will result in the missed exam//assignment counting in as a zero. All proof of excused absences MUST be shown PRIOR to the student making up the assignment/exam, and MUST be BEFORE the last day of class.** Students may be dismissed for 10 hours of absence. If you drop the class you must do so officially or you may receive an “F”.  
  
**Assessment -**  Your grade in this class is based upon the points YOU earn through completing assignments, quizzes, presentations, and exams. Nothing in this class is curved. Your grade is based upon your performance. Your final grade in this class is based on your percentage score out of 800 points. See the table below.

You may do up to 20 points of extra credit work to raise your total points earned (please see attached list). All extra credit is due the last day of class – not the day of the final. By doing extra credit you agree that you will NOT ask to have your grade “bumped up” at the end of the semester.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Points Possible** | | **Total Points Possible** | | **% of Grade** | |
| **Exams** | 2 exams at 100 points each | | 200 | | 25.0% | |
| **Quizzes** | 10 quizzes at 20 points each | | 200 | | 25.0% | |
| **Activities** | 10 activities at 20 points each | | 200 | | 25.0% | |
| **Presentation** | 2 at 100 points each | | 200 | | 25.0% | |
|  |  | | 800 | | 100% | |
|  |  | |  | |  | |
|  | | A = > 90% | | > 720.0 points | |
| B = 80 - 89% | | 640.0 - 719.9 points | |
| C = 70 - 79% | | 560.0 - 639.9 points | |
| D = 60 - 69% | | 480.0 - 559.9 points | |
| F = < 60% | | < 480.0 points | |

**TENTATIVE SCHEDULE**

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| --- | --- | --- | --- |
| **Week** | **Date** | **Topic** | **Chapter** |
| 1 | 1/15 | Lecture: Introduction | 1 |
|
| 2 | 1/22 | Lecture & Activity: Plate Tectonics & Map Activity | 2 |
|
| 3 | 1/29 | Lecture & Activity: Plate Tectonics & Map Activity | 2 |
|
| 4 | 2/5 | Lecture: Marine Provinces  Lecture: Marine Sediments | 3 & 4 |
|
| 5 | 2/12 | **Lincoln’s Birthday/Presidents Day – Campus Closed** | - |
|
| 6 | 2/19 | Lecture & Activity: Seawater & Seawater Data Activity | 5 |
|
| 7 | 2/26 | **PRESENTATIONS (co-evaluations and group evaluations due TODAY)** | - |
|
| 8 | 3/4 | **MIDTERM EXAM** | - |
|
| 9 | 3/11 | **Spring Break – Campus Closed** | - |
|
| 10 | 3/18 | Video & Video Review | - |
|
| 11 | 3/25 | Lecture & Activity: Atmospheric Circulation & Activity part 1 | 6 |
|
| 12 | 4/1 | Lecture & Activity: Oceanic Circulation & Activity part 2 | 7 |
|
| 13 | 4/8 | Lecture: Waves | 8 |
|
| 14 | 4/15 | Lecture & Activity: Tides & Tidal Patterns Activity | 9 |
|
| 15 | 4/22 | Lecture & Activity: Coastal Processes & Sands Activity | 10 |
|
| 16 | 4/29 | **PRESENTATIONS (extra credit, co-evaluations and group evaluations due TODAY)** | - |
|
| 17 | 5/6 | **FINAL EXAM - 9:00 a.m. - 11:00 a.m.** | |
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| **Cheating and plagiarizing will not be tolerated.** |  | **ANYONE caught cheating or plagiarizing an assignment  will receive an “F” in the class. NO EXCEPTIONS.** |

**Activities:**

There will be several in-class activities during the course of this class. You are responsible for bringing in the necessary supplies. In addition, you may be responsible for answering a few of the “end-of-chapter” review/critical thinking question. Each assignment is worth 20 points each. You will be graded on neatness, completeness of activity, and ability to follow directions. **Late work will not be accepted.**

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| **Topic** | **Points Possible** | **Date Due** |
| Plate Tectonic Maps Project (3 maps + questions) | 60 | 2/17 |
| Seawater Data | 20 | 2/29 |
| Presentation #1 | 100 | 2/22 |
| Video Review #1 | 20 | 3/16 |
| Atmospheric & Oceanic Circulation Maps + questions | 40 | 4/4 |
| Tidal Patterns | 20 | 4/18 |
| Video Review #2 | 20 | 4/20 |
| Beach Sands | 20 | 4/25 |
| Presentation #2 | 100 | 4/25 |

**Quizzes:**

Students are required to log onto Canvas and take a weekly quiz. Each quiz will be worth 20 points and will cover what we have learned (or will learn) in class that week. Students may access the quiz anytime from 8 am Monday through 11:59 pm the following Sunday. Students may take the quiz only once. Students who do not take the quiz during the allowed time will not be allowed to make up the quiz unless they have an excused absence. **No exceptions!**

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| --- | --- | --- | --- | --- |
| **Quiz #** | **Topic** | **Dates Available** | | |
| 1 | Introduction | 1/11 | - | 1/17 |
| 2 | Plate Tectonics | 1/18 | - | 1/24 |
| 3 | Plate Tectonics | 1/25 | - | 1/31 |
| 4 | Features of the Sea Floor | 2/1 | - | 2/7 |
| 5 | Marine Sediments | 2/8 | - | 2/14 |
| 6 | Seawater | 2/15 | - | 2/21 |
| 7 | Atmospheric Circulation | 3/21 | - | 3/27 |
| 8 | Oceanic Circulation | 3/28 | - | 4/3 |
| 9 | Waves | 4/4 | - | 4/10 |
| 10 | Coastal Processes | 4/18 | - | 4/24 |

**Exams:**

There will be two exams, worth 100 points each. **Make-up exams will be given only to those who can verify a valid excuse for missing an exam**. The make-up will be given at a time that is mutually agreeable to both the student and myself, but must be arranged prior to the initial exam. **Failure to take the make-up exam within two weeks of the original exam date will result in the missed exam counting in as a zero**.

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| --- | --- | --- |
| **Exam #** | **Topic** | **Date** |
| 1 | Introduction through Seawater | 2/29 |
| 2 | Atmospheric Circulation through Coastal Processes | 5/2 |

Presentations

Each student will participate in a group presentation to be given to the class during the semester. Placement into groups will be done by a lottery, as will the assignment of topics. The topics are outlined in your textbook and will not be discussed in my lectures. Your group will be leading the class in learning about your chosen subject.

The presentations are expected to be 10 - 15 minutes in length. The format of the presentation is up to the group. You may use the chalkboard, overheads, a PowerPoint presentation, poster board, or any other method you deem worthy. Recall that your primary goal is to teach your fellow students. When preparing your presentation, keep in mind that you need to clear and concise, have a logical flow of ideas, keep your text legible (e.g., use a large enough font so that the people in the back can see), use relevant information, and be professional.

Your presentations will be graded as follows (rubric included on next page):

* 40% Accuracy of content.
* 20% Visual quality of presentation
* 20% Quality of presentation
* 20% “Self Grades” - each member of the group will grade the other members on the quality of their participation to the project. So if one member flakes out and the others have to pick up the slack, this is their chance to let it be known.

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| --- | --- |
| * 1. Exploration via submersibles | Week before midterms |
| * 1. How Sea Turtles Navigate |
| * 1. Bermuda Triangle |
| * 1. Use of diatoms |
| * 1. Geologic History of the Mediterranean Sea |
| * 1. K-T event |
| * 1. Deep Sea Drilling |
| * 1. OTEC systems |
| * 1. Galveston Hurricane |
| * 1. SOFAR channel |
| * 1. Ben Franklin and the Gulf Stream |
| * 1. Lituya Bay, Alaska tsunami | Week before finals |
| * 1. Rogue Waves |
| * 1. Tidal Bores |
| * 1. Moving the Cape Hatteras Lighthouse |
| * 1. Exxon Valdez Oil Spill |
| * 1. Deep Scattering Layer |
| * 1. Red Tides |
| * 1. Peruvian Anchoveta Fishery |
| * 1. How Killer Whales Use Echolocation |
| * 1. Coral Bleaching |
| * 1. How long would an organism's remains remain on the sea floor? |

**Student Presentations**

**Scoring:**

**Good** (all criteria met or exceeded) = full points

**Fair** (most criteria met, a few mistakes) = 1/2 of possible points

**Poor** (few criteria met, lots of mistakes) = 1/4 of possible points

**None** (not done) = no points

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| --- | --- | --- |
|  |  | **Points possible** |
| **Accuracy of content (40 points)** | |  |
|  | Understanding of material being presented | 20 points |
|  | Quality of research | 10 points |
|  | Accuracy of material being presented | 10 points |
|  |  |  |
| **Visual quality of presentation (20 points)** | |  |
|  | Text easy to read and not cluttered | 5 points |
|  | Quality of images or props | 5 points |
|  | Logical flow of ideas | 5 points |
|  | Stays within time limits (*-½ point for each minute over/under*) | 5 points |
|  | |  |
| **Quality of presentation (20 points)** | |  |
|  | Delivery (speaks clearly, not rushed, pronounces words correctly) | 5 points |
|  | Speaks to class, not to the projection screen | 5 points |
|  | Material relevant to topic | 10 points |
|  |  |  |
| "Self Grades" - see attached evaluations (10 points) | | 10 points |
| Class Evaluations (Average of all evaluations - 10 points) | | 10 points |
|  | |  |
| **Total** | | **100 points** |

**EXTRA CREDIT**

You have the opportunity to earn extra credit in any of my classes if you wish. All work must be turned in by the beginning of the class period before the final exam. You may earn up to 20 points of extra credit by doing any combination of the following assignments listed below.

1. (*1 point each*) Do one of the following activities from Center for Microbial Oceanography: Research and Education (C-MORE) website:
   1. Take the [Microbe Personality Quiz](http://cmore.soest.hawaii.edu/education/kidskorner/microbe_quiz.htm) to learn more about the microbes that live in the ocean. Copy/paste what microbe you are in an email and send it to me OR print out the page showing what microbe you are and hand it to me during class.
   2. Do the [Microbial Oceanography Word Search](http://cmore.soest.hawaii.edu/education/kidskorner/wordsearch.htm) to learn more about the microbes that live in the ocean. Then, print out the completed word search and hand it to me during class.
   3. Are you smarter than a microbe? [Test Your Microbe IQ!](http://cmore.soest.hawaii.edu/education/iq/index.htm) At the end, either print out your score and hand it to me during class, or copy/paste it in an email and send it to me. Don’t forget to enter the drawing for a chance to win a plush microbe.
2. (*5 points*) In essay format, discuss three ways that you can help clean up the oceans or coasts.
   1. The ONLY item at the top of your paper should be your name.
   2. Paper should be 1 to 2 pages, typed, 1.5 spacing, standard margins and fonts and concise.
   3. The quality of your English composition is important. Don't forget to use correct essay form - Intro paragraph with thesis statement, three examples, and conclusion paragraph.
   4. Please remember that I am concerned about the environment. I do not want plastic covers, extra cover pages, or any other type of binder.
3. (*15 points*) Find 3 articles that deal with geological issues and write a summary of each article. Combine the 3 summaries into a paper that is no more than 2 pages long. Articles may be found in the Los Angeles Times, Discover Magazine, Newsweek, Time Magazine, California Geology (in the Library), etc. Provide your opinion or analysis.
   1. The ONLY item at the top of your paper should be your name.
   2. Paper should be 1 to 2 pages, typed, 1.5 spacing, standard margins and fonts and concise.
   3. The quality of your English composition is important. Don't forget to use correct essay form - Intro paragraph with thesis statement, three examples, and conclusion paragraph.
   4. A **bibliography** and **copies of your articles** are required as well.
   5. Please remember that I am concerned about the environment. I do not want plastic covers, extra cover pages, or any other type of binder.
4. (*10 points*) Do one of the Virtual Classware assignments located at <http://www.sciencecourseware.com/>. Click on "[Geology Labs Online](http://www.sciencecourseware.com/GLOL/)" and choose one of the activities listed below. Upon completion of the assignment, you will be awarded a certificate that you will need to print out and turn in.
   1. You may do more than one of the exercises, but they must be two DIFFERENT activities: Virtual Earthquake, Virtual river (River Discharge), Virtual river (River Flooding), Virtual Seismologist, Virtual Radiochronologist (isochron), Virtual Radiochronologist (radiocarbon) or Virtual Climatologist
   2. Your name MUST be on the certificate. No exceptions.

See other side!

1. (*15 points*) Create at Disaster Plan for your home.
   1. Use [this template](http://www.geophile.net/ExtraCredit/ExtraCredit_EmergencyPlan_template.docx) to complete this report. The report MUST use this template!
   2. Visit the My Hazards Awareness Map Web site (<http://myhazards.calema.ca.gov/Default.aspx>). Put in your home address in the search bar at the top of the page, then click “Map Search”. The program will then look up your address and determine if it is in a hazard zone.
   3. Create an Emergency Disaster Plan for yourself and your family. This plan should be tailored to you and your family’s needs and should be for any type of emergency. Items to include are:
   * A map of your house (or apartment) showing the location of major utilities (gas, water, etc.), escape route & earthquake supplies and potential hazards (heavy furniture, bookcases, large windows or mirrors, etc.). This map may be hand-drawn
   * An evacuation plan – how are you going to exit your home, where are you going to meet, etc.
   * A list of household members (Identify anyone with impairments or who may need help evacuating), including contact phone numbers.
   * The name and phone number of an out-of-state contact
   * Go to the Be Red Cross Ready site at:  [http://arcbrcr.org/](%20http:/arcbrcr.org/). On the “Create Your Own Emergency Preparedness Kit” page, fill out all of the information for YOUR family, then click “calculate” This will show you how much of each supply you will need for your family. Then click on the “click here to send your customized emergency preparedness list”. Fill out the required information and email the list to yourself. Include this list in your report.

**IMPORTANT POLICIES (a.k.a. the “fine print”)**

**Your enrollment in this class indicates that you agree to abide by these policies!**

* **Statement of Reasonable Accommodation**:
  + - Pasadena City College faculty members fully support the Americans with Disabilities Act (ADA). Pasadena City College provides reasonable accommodations to facilitate the participation of students with qualified disabilities. Questions about, concerns with, and requests for reasonable accommodations or additional information may be addressed to Disabled Student Programs and Services (D209).
    - Reasonable accommodation may involve allowing a student to use an interpreter, note taker, or reader; accommodation may be needed during class sessions and for administration of examinations. The intent of the ADA in requiring consideration of reasonable accommodation is not to give a particular student an unfair advantage over other students, but simply to allow a student with disability to have an equal opportunity to be successful.
* **Student Conduct**:
  + Policy No. 4520: It is the policy of the Pasadena Area Community College District that Pasadena City College seeks to maintain a safe, orderly, and constructive campus environment in which there is freedom to learn and respect for the dignity of all members of the College community. Students are expected to be responsible, honest, and non-violent in exercising their rights to free inquiry and free speech.
  + The Student Conduct Code identifies conduct that is prohibited by College policy. Students who violate the Student Conduct Code will be subject to disciplinary action under the Student Discipline Process Procedures. Disciplinary sanctions depend on the nature of the offense, the past pattern of behavior of the student, and other relevant factors. In addition, student drug or alcohol offenses or other criminal acts, may be referred to law enforcement officials.

**Cheating and plagiarizing will not be tolerated.**

* **Absences**:
  + All absences are considered unexcused unless valid proof of the absences is submitted. All proof of excused absences MUST be shown PRIOR to the student making up the assignment/exam, and MUST be BEFORE the last day of class. Please contact me by email if you know you will be absent on a certain date, and why.
  + Students who miss a class due to an unexcused absence will NOT be allowed to make up the work. Make-up assignments will be given only to those who can verify a valid excuse for missing the assignment. The make-up assignment will be given at a time that is mutually agreeable to both the student and myself.
  + Failure to take the make-up assignment within one week of the original assignment date OR before the last week of class will result in the missed exam//assignment counting in as a zero.
* **Grading:**
* Pasadena City College policy allows a grade of incomplete to be given only to those who have been sick, injured, or have a similar valid excuse. A grade of “incomplete” will not be given after poor performance in the course.
* Pasadena City College grading system guidelines can be found in the current catalog. Students may access this catalog online.
* College policy requires that all students shall be graded in *exactly* the same fashion. What does this mean? **You may not ask for extra assignments or to repeat an exam to improve your grade, or additional assignments after the course is completed**.
* Grades in this class are based upon points earned on assignments, quizzes, and exams. All assignments will be returned to the student after grading. Periodic progress reports will be emailed to students so that they may keep track of their progress in the class. Students are responsible for contacting me BEFORE the final exam with any errors or omissions.
* You may do up to 20 points of extra credit work to raise your total points earned (please see attached list). All extra credit is due the last day of class – not the day of the final exam. By doing extra credit you agree that you will NOT ask to have your grade “bumped up” at the end of the semester.
* **Your final grade is based upon the points you EARN in the class. Thus, you do not “deserve” a certain grade – you earn it.**