Saint Louis University, Madrid Campus

Faculty: Science and Engineering
Professor: Mónica Pérez-Bedmar, M.Sc.
Course Name: Introduction to Oceanography
Course Code: EAS-1050-M01
Semester: Fall 2015
Credit Hours: 3 credits
Email: mperezbe@slu.edu
Class hours: M & W 17:30-18:45
Classroom: PRH3
Office Hour: M 16:30-17:30 and upon request

Course Description: This course will provide an approach to the study of the ocean in basic formation, chemical and physical properties of seawater, waves, currents, tidal forces and tides, interaction of land and ocean in coastal environments, marine biology and ocean resources. A field trip will also complement the understanding of present day issues in Oceanography from a Spanish perspective.

Course Objectives: To have students understand the formation of the oceans, the chemical and physical processes the oceans undergo, and why organisms live in their environments, and how humans interact and impact these different environments.

Learning Outcomes: On successful completion, the students should:
- A greater interest in the oceans
- A familiarity with basic terminology and descriptions of materials and processes in the subdisciplines of geological, physical, chemical and biological oceanography
- An appreciation of the importance of the world ocean to our planet
- A healthy skepticism of facts and an appreciation for where knowledge comes from
- A desire to better protect the oceans through active involvement with government and environmental organizations.

Mandatory trip: A visit to Spain’s southeastern coast to study the main environmental issues the Mediterranean Sea is facing. The field trip includes visit to oceanography institutes, a desalination site, natural reserves and natural parks. The excursion includes diving exercise at one of the most important Mediterranean reserves, Islas Hosmigas, off the coast of Murcia, which provides the opportunity – weather permitting – to snorkel in its crystal blue waters and identify the different organisms studied in the course. The trip also includes kayaking along the most developed Mediterranean coastlines, to identify coastal issues and successful restoration projects. Price includes transportation, lodging, excursions included in final itinerary, and breakfast.

Grading System
The grade will be obtained from the following areas:
Mid-term I: 20%
Mid-term II: 20%
Final: 20%
Poster presentation: 10%
Field trip report: 15%
Article reviews: 10%
Attendance, class participation: 5%
Grading Scales from Exams
A  93-100%
A-  90-92.9%
B+  87-89.9%
B   83-86.9%
B-  80-82.9%
C+  77-79.9%
C   73-76.9%
C-  70-72.9%
D   60-69.9%
F   0-59.9%

Academic Honesty
The University is a community of learning, whose effectiveness requires an environment of mutual trust and integrity, such as would be expected at a Jesuit, Catholic institution. As members of this community, students, faculty, and staff members share the responsibility to maintain this environment. Academic dishonesty violates it. Although not all forms of academic dishonesty can be listed here, it can be said in general that soliciting, receiving, or providing any unauthorized assistance in the completion of any work submitted toward academic credit is dishonest. It not only violates the mutual trust necessary between faculty and students but also undermines the validity of the University’s evaluation of students and takes unfair advantage of fellow students. Further, it is the responsibility of any student who observes such dishonest conduct to call it to the attention of a faculty member or administrator.
Examples of academic dishonesty would be copying from another student, copying from a book or class notes during a closed-book exam, submitting materials authored by or editorially revised by another person but presented as the student’s own work, copying a passage or text directly from a published source without appropriately citing or recognizing that source, taking a test or doing an assignment or other academic work for another student, tampering with another student’s work, securing or supplying in advance a copy of an examination without the knowledge or consent of the instructor, and colluding with another student or students to engage in an act of academic dishonesty.
Where there is clear indication of such dishonesty, a faculty member or administrator has the responsibility to apply appropriate sanctions. Investigations of violations will be conducted in accord with standards and procedures of the school or college through which the course or research is offered. Recommendations of sanctions to be imposed will be made to the dean of the school or college in which the student is enrolled. Possible sanctions for a violation of academic integrity include, but are not limited to, disciplinary probation, suspension, and dismissal from the University. The complete SLU Academic Honesty Policy can be found at the following link:
http://spain.slu.edu/academics/academic_advising/docs/Academic_integrity.pdf

Students with Disabilities
In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. Students who think they might benefit from these resources can find out more about:

- Course-level support (e.g., faculty member, departmental resources, etc.) by asking your course instructor.
University-level support (e.g., tutoring/writing services, Disability Services) by visiting the Academic Dean’s Office (San Ignacio Hall) or by going to http://spain.slu.edu/academics/learning_resources.html.

Students who believe that, due to a disability, they could benefit from academic accommodations are encouraged to contact Disability Services at +34 915 54 58 58, ext. 204, send an e-mail to counsellingcenter-madrid@slu.edu, or to visit the Counseling Office (San Ignacio Hall). Confidentiality will be observed in all inquiries. Course instructors support student accommodation requests when an approved letter from Disability Services has been received and when students discuss these accommodations with the instructor after receipt of the approved letter.

**Policies**
1. Students are encouraged to participate in class discussions and to ask questions.
2. Announcements may be made during the semester.
3. Syllabus, reading and articles are subject to change.
4. Students are responsible for all lecture material, handouts, homework and assigned reading.
5. It is mandatory to attend all classes unless a reasonable excuse is given.
6. Make up exams are not given. Students who legitimately miss an exam, due to a doctor’s visit or family emergency must provide written documentation of the circumstances. A letter from the university counselor is accepted. Exams that are missed illegitimately result in a score of F. Grades for these students will be based on the remaining exams. Missing more than one exam results in an F grade.

**Collection of student work for assessment**
Saint Louis University - Madrid Campus is committed to excellent and innovative educational practices. In order to maintain quality academic offerings and to conform to relevant accreditation requirements, we regularly assess our teaching, services, and programs for evidence of student learning outcomes achievement. For this purpose we keep on file anonymized representative examples of student work from all courses and programs such as: assignments, papers, exams, portfolios, and results from student surveys, focus groups, and reflective exercises. Thus, copies of your work for EAS-105 (e.g. any exams, oral presentations, assignments, submitted papers and/or portfolios) may be kept on file for institutional research, assessment and accreditation purposes. If you prefer that Saint Louis University-Madrid Campus does not keep your work on file, you will need to communicate your decision in writing to your professor.

**Week/Topic**

**September 2- Introduction: Why Study the Oceans? Geographical Aspects**
Overview of the course. Importance of the oceans and marine science. Dimensions and make-up: latitude and longitude; geophysical descriptions; geochemical descriptions.

**September 7- A History of Marine Science.**
History of ocean exploration and the beginnings of ocean science. A discussion of a few of the major breakthroughs and discoveries that have expanded our knowledge of the oceans.

**September 9- Did life start salty?**
The origin of the earth, the oceans and life. Could there be life elsewhere?
**September 14- Plate Tectonics**
Plate theory: Sea floor spreading and continental drift; evidence of these processes.

**September 16- Continental Margins and Ocean Basins**
Continental Margins and Ocean Basins and Consequences of Change. Features of the sea floor.

**September 21 - Coastal Morphology**
Formation and morphology of coastlines. Primary and secondary coast. Biological modified coasts.

**September 23- Coastal Environments and Issues**
The physical environment of the United States coastline...coasts, estuaries, beaches, waves, tides... trends in population development along the coast...Resources of the near shore environment. Comparison between Spain and the U.S. Coastal Issues.
- Review for Field Trip

**Field Trip- Sep 24-27**

**September 28-** Review for Midterm I, 1st set of articles due

**September 30-** Midterm I

**October 5- Atmospheric Circulation**

**October 7- Ocean Circulation**
Ocean Currents: what are they, how do they form, and what is their role in the global scheme of things? Wind-driven ocean circulation and upwelling. Density driven circulation. The great conveyor belt.

**October 12- National Holiday**

**October 14- Ocean Chemistry and Ocean Physics**
Elements in seawater; residence times; conservative and non-conservative properties; biogeochemical cycles; tracers of circulation.

**October 19- The Clines**
The physical structure of the oceans: Pycnocline, thermocline, halocline. Temperature/salinity/density... Light and sound in the ocean.

**October 21- Waves and Tides**
Types of waves. Shallow vs. deep waves. Tsunamis. Tidal patterns and types.

**October 26- Climate Change**
Fact or fiction? Historical trends. Measurements of climate change. Consequences and solutions.

**October 28-** Review Midterm II, 2nd set of articles due

**November 2- Midterm II**
November 4- Marine Ecology

November 9- National Holiday

November 11- A View of Life in the Oceans
Primary productivity of the oceans. Different types of primary producers -- bacteria; diatoms, dinoflagellates, coccolithophores and plants; Measuring primary production.

November 16- Zooplankton and Marine Invertebrates
Types of zooplankton and marine invertebrates: Ways of feeding, vertical migration, bioluminescence, life histories - holoplankton vs meroplankton; lifestages. Food chains and food webs.

November 18- Marine turtles
Types, endangered and threatened species, nesting characteristic, principals treats, protective measures and hard bottoms

November 23- Nekton, the free swimmers
Fish - variety of forms, some examples: demersal forms (cod), pelagic forms (tuna, swordfish), small pelagics (sardines, anchovies). Types, physiological characteristics, geographical distribution. Are sharks a threat to humans or humans threats to sharks?

November 25- Ecosystems in the Sea
Oligotrophic central gyres - the ocean deserts; Nutrient-rich subpolar regions; Upwelling regions; Coastal regions; Estuaries. The benthos - in/on the sediments; Vents, reefs

November 30- Marine Mammals and Cetaceans
Types of marine mammals; migration patterns, tracking endangered species. Types of cetaceans, life styles, endangered species, behavior patterns, protective measures Understanding behavior. Whales and marine mammals: their past and future.

December 2- Oceanic Resources and Marine Pollution
Marine life, food chains, productivity, types of resources, regulations and protection. Emphasis is on the physical environment, and influence of human population, exploitation. Red Tides and Harmful Algae Blooms. Petroleum Spills.

December 7- Presentations

December 9- Review for final and 3rd set of articles due

December 16- Final Exam (15:30- 18:30)