

GEO 3222: SEA LEVEL SCIENCE
T| Period 6, R| Period 5-6
3012 Turlington Hall

SPRING 2023

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PREREQUISITES: Sophomore standing or higher

COURSE DESCRIPTION:

This course explores why sea level varies in space and time. Students will learn how sea level is measured, why there are differences between global and regional sea level, and how tides, storms, and the loss of glaciers and ice sheets alter the elevation of the sea. Understanding the drivers of sea level change over minutes to millennia helps coastal communities threatened by flooding events predict and mitigate future impacts.

COURSE GOALS

1. Develop fundamental geospatial skills and concepts needed to assess processes that produce sea level change
2. Understand how sea levels have changed in the past and how they continue to change
3. Understand the complexity of sea level science and the uncertainty in planning for the future
4. Appreciate how natural and physical sciences are used to address real-world problems
5. Develop oral and written science communication skills

COURSE LEARNING OUTCOMES

By the end of this course, students will be able to:

- Explain the term “sea level” and describe techniques for measuring sea level
- Identify where to find and download sea level data from around the world
- Quantify patterns in sea level data to assess how sea level is changing
- Differentiate the mechanisms that produce changes in sea level over the short-term and the long-term
- Interpret the drivers of sea level change on a regional and global basis
- Compare current changes of sea level to past sea level variation
- Identify and discuss future projections of sea level and the related uncertainty
- Communicate findings in written and oral formats

REQUIRED TEXTS

There is no required textbook for this course. Students will be assigned readings on a weekly basis and these will be made available on Canvas or in hard copy from the instructor

GENERAL COURSE POLICIES

Late Work

Work that is handed in late will receive an automatic 10% deduction. If you foresee an issue with a deadline, clemency may be granted for late work if you speak with me EARLY before submission with valid excuse. Please communicate to me any problems with assignments submissions or discussions. Please document your problems as best possible (doctor’s or ER slip, obituary, etc.). No late work will be

accepted after the last day of classes. Make-up assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Attendance

If you must miss a class for any reason please contact me by email or phone prior to the absence. Excused absences are consistent with university policies in the undergraduate catalog

(<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>) and require appropriate documentation. You will be responsible for obtaining any handouts and/or materials that were distributed during your absence.

Grade Disputes

Should a student wish to dispute any grade received in this class (other than simple addition errors), the dispute must be in writing and be submitted to the instructor within a week of receiving the grade. The dispute should set out very clearly, the grade that the student believes the assignment should have received as well as why they believe that they should have received such a grade.

Cell Phones

Cell phones must be turned to silent or, for emergencies only, be set to “vibrate” during class. In the event of an emergency (and in order to keep from disturbing others), you must leave the classroom to accept an emergency call. You may not answer a call or text in the classroom. Disregard for these guidelines may result in disciplinary action, which could include the student being excused from class and marked absent for that day.

EVALUATION OF STUDENT PERFORMANCE:

| | |
|----------------------------|-----|
| In-Class Quizzes | 20% |
| Activities and Discussions | 34% |
| Participation | 6% |
| Final Project | 40% |

GRADE DISTRIBUTION

1. Quizzes (200 points)

Students will receive short, approximately bi-weekly quizzes through Canvas. Quizzes will be based on course readings, class activities, and lecture material from the previous two weeks. Each quiz is worth 40 points, and the final grade will be determined using the best 5 grades out of the 6 quizzes, with the lowest grade being dropped.

2. Activities and Discussions (340 points)

In-class activities and/or discussions will be assigned on a weekly basis. Most activities are intended to be completed in class. Students are expected to participate actively in these activities and discussions. Students can expect to lead class discussions based on a course topic. Each activity is worth 34 points, and the final grade will be determined using the best 10 grades out of the 11 activities, with the lowest grade being dropped.

3. Participation (60 points)

Attendance and participation is required. You will earn 2 points for each class session that you attend from beginning to end and in which you actively participate in a professional manner, for a total of 60 points. The grade is determined by tardiness, absenteeism, participation in group activities, prior preparation, and associated classroom activities.

4. Final Project (400 points)

Students will collect sea level data from two contrasting locations around the world and assess how sea level is changing regionally in an oral presentation and written paper. This project is composed of multiple parts, where students will first download and plot sea level observations from two selected data sets, then analyze and interpret the data. Results will be summarized in both an in-class presentation and a written paper. Stages of project development will be graded and returned to the student to ensure progress.

Required Products:

- Location selection (due week 4, 50 points)
 - Students will select and submit two sea level data sets for their final project. Students must choose stations at two different sites located on different continents or oceans with a length of at least 50 years.
- Data Download and Format (due week 6, 50 points)
 - Students will submit a downloaded and formatted data file and one figure of a sea level time series for one of their two selected locations. Acceptable data formats include .csv, .xlsx, .txt, .mat.
- Project Research Questions Outline (due week 8, 50 points)
 - Students will provide a outline of the research questions they are asking for their final paper. An outline will help to arrange and develop ideas to guide student final presentations and papers. The outline should consider the following sections:
 - Introduction
 - Study Area (Where are your tide gauges located?)
 - Methods (Where is your data from and how are you analyzing it?)
 - Results and Discussion (How is sea level changing at your locations? What are the drivers of sea level change?)
- In-Class Presentation (due week 14, 100 points)
 - In class presentations will focus on the interpretation of the tide gauge data. Students should consider the following in their presentations, guided by their outlines:
 - Geographic location of tide gauges
 - Summary of key findings including facts, inferences, and conclusions
 - Future sea level trends and projections
- Final Paper (due Finals week, 150 points)
 - Final paper will be based off previous project outline and in class presentations
 - Students should include a final section on future sea level trends, projections and potential impacts
 - Be sure to cite all sources!

Grading Scale (& GPA equivalent):

decimals will be rounded up to the nearest integer. For example, a 92.2 and a 92.8 would become a 93 to qualify for an A

| A | A- | B+ | B | B- | C+ | C | C- | D+ | D | D- | E |
|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|-----------------|------------|
| 100-93 (4.0) | 92-90 (3.67) | 89-87 (3.33) | 86-83 (3.0) | 82-80 (2.67) | 79-77 (2.33) | 76-73 (2.0) | 72-70 (1.67) | 69-67 (1.33) | 63-66 (1.0) | 62-60 (0.67) | 59- (0) |

Note: A grade of C- is not a qualifying grade for major, minor, Gen Ed, or College Basic distribution credit. For further information on UF's Grading Policy, see:

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/#hgrades>

COURSE SCHEDULE

Students should note that the syllabus is a guideline and that there may be changes to the class schedule and activities. The due dates below are tentative and can be changed at the discretion of the instructor. Please refer to our Canvas site for the most updated

| Week | Course Material | Assignments |
|---------------------|---------------------------------------|---|
| 1 | course introduction + logistics | Activity 1 |
| 2 | measuring sea level | Activity 2 |
| 3 | datums and sea level statistics | Activity 3 Quiz 1 |
| 4 | tidal harmonics + prediction | Activity 4 Project locations selection |
| 5 | tides in the real world | Activity 5 Quiz 2 |
| 6 | storm surge and meteotsunamis | Activity 6 Project Data Submission due |
| 7 | waves (wind + tsunami) | Activity 7 Quiz 3 |
| 8 | seasonal and interannual variability | Activity 8 Project Research Questions |
| 9 | progress and project check in | Mid-Course assessment Quiz 4 |
| <i>SPRING BREAK</i> | | |
| 10 | drivers of long-term sea level change | Activity 9 |
| 11 | understanding past sea level | Activity 10 Quiz 5 |
| 12 | future sea level change | |
| 13 | extreme sea levels and flood risks | Activity 11 Quiz 6 |

- 14 responding to sea level rise impacts Project presentations due
- 15 implications for Florida; course wrap up

EXAM WEEK

Final paper due Apr 28 by
midnight

COMPUTERS

Students must provide their own computer on which to work on assignments during and/or outside of class and take quizzes on Canvas. Any required software will be available to students through UF Apps at <https://info.apps.ufl.edu> or open-source downloading.

ACADEMIC HONESTY

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor in this class.

Violations of the Honor Code such as plagiarism will not be tolerated. Acts of plagiarism will receive a 0 on the assignment as well as disciplinary action for academic integrity.

STUDENTS REQUIRING ACCOMODATIONS

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

COURSE EVALUATION

Student feedback is greatly appreciated and taken seriously. Students are expected to provide professional and respectful feedback on the quality of instruction of this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menus under GatorEvals, or via <http://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

COUNSELING AND MENTAL HEALTH RESOURCES

Students facing difficulties completing the course or who are in need of counseling or urgent help should call the on-campus Counseling and Wellness Center (352-392-1575; <https://counseling.ufl.edu/>).

ADDITIONAL CAMPUS RESOURCES

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or email to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>

Career Resource Center, Reitz Union, 352-392-1601. Career assistance and counseling.
<http://www.crc.ufl.edu>

Library Support, <http://cms.uflib.ufl.edu/ask> Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 352-392-2010 or 352-392-6420. General study skills and tutoring.
<http://teachingcenter.ufl.edu/>

Writing Studio, 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
<http://writing.ufl.edu/writing-studio/>

Student Complaints, <https://registrar.ufl.edu/writtencomplaints>

Health and Wellness Resources

U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352-392-1575 so that a team member can reach out to the student.

Sexual Assault Recovery Services (SARS), Student Health Care Center, 352-392-1161. More information on resources to help students with sexual violence issues at www.umatter.ufl.edu/sexual_violence

Sexual Harassment, Information on UF policies, awareness, reporting, and counseling at www.hr.ufl.edu/managerresources/policies-2/sexual-harassment/

University Police Department, 352-392-1111 (or 9-1-1 for emergencies). <http://www.police.ufl.edu/>