Oceanography and Meteorology, GEOL 3314

Term: Spring 2026
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Course Dates: January 12, 2026–April 29, 2026
Course Times: Online via Canvas
Office Hours: Monday–Friday, 10am–5pm (by appointment)

Course Overview

This course provides an integrated introduction to oceanography and meteorology, focusing on how the Ocean and atmosphere function as interconnected systems that shape weather, climate, and life on Earth. Students explore the foundations of Ocean–Atmosphere interactions through hands-on demonstrations, inquiry-based activities, virtual tools, and real-world data from NOAA, NASA, and global observing networks. Throughout the semester, students examine topics ranging from the origin of the Ocean and its role in storing heat, to atmospheric circulation, waves, tides, Ocean currents, weather systems, storms, ENSO events, coastal processes, long-term climate patterns, and the intricate relationships between the Ocean, atmosphere, and human activities. The course draws upon basic knowledge from biology, chemistry, physics, and geology to support a comprehensive understanding of the world's Ocean and its interaction with the atmosphere. Discovery-based learning helps students build conceptual understanding while connecting scientific ideas to everyday experiences. The course is designed for students from all majors. No prerequisites are required.

Student Learning Outcomes

After successful completion of this course, students will be able to:

1) Explain how energy, temperature, salinity, density, Earth's rotation (Coriolis effect) and circulation shape Ocean–Atmosphere interactions across weather and climate systems. (Critical Thinking; Empirical & Quantitative Skills)
2) Describe major physical features of the Ocean and interpret how Ocean morphology influences circulation patterns, weather systems, and long-term climate processes. (Critical Thinking; Empirical & Quantitative Skills)
3) Apply collaborative problem-solving skills to interpret Ocean and atmospheric processes using observations, data, and scientific reasoning. (Teamwork; Communication; Critical Thinking)
4) Discuss complex weather events and identify steps leading to their development. (Critical Thinking, Communication)
5) Investigate scientific evidence related to climate change. (Critical Thinking, Empirical and Quantitative Skills)

Required Textbooks and Readings

There is no required textbook to purchase for the course. All materials are open access and available online through the course Canvas structure.

Graded Course Requirements Description

Weekly reflective responses and discussion activities are incorporated into the course to provide opportunities for authentic use of the vocabulary and terminology covered. In addition, at-home lab experiments will be conducted by students, and the results will be shared with the class via video summaries. Weekly quizzes cover all materials in each module, and a final research activity provides an opportunity for students to share their learning accomplishments and provide peer feedback.

Performance Assessments: Grading is based on the total number of points earned at the end of the semester in the following categories: discussion board entries, at-home lab practice activities (completed at home, recorded, and shared with the class), performance on weekly quizzes and the final research presentation, and completion of the base knowledge survey and growth self-assessment.

1. Learning Growth Assessments

A required Baseline Survey is completed at the beginning of the semester to capture students' initial understanding of how the Ocean and atmosphere shape the world. Full points are awarded upon completion, regardless of the number of correct answers recorded (10pts). No outside resources should be used, as authentic responses are essential for accurately assessing learning progress at the end of the course. A related assessment activity is completed at the end of the semester (10pts). A set of reflective questions accompanies this final activity and is used to compare initial and end-of-semester responses to determine learning growth (15pts). In addition, three (3) mandatory Zoom meetings occur during the semester (30 points). **(65 points; 10% of the final grade)**.

2. Discussion Board Participation

Active participation in the Discussion Board is required. The Discussion Board fulfills several important functions, including:

- Ensuring students keep up with the required readings, videos, and online discussions;
- Supporting higher order thinking and critical reflection on course materials;
- Providing opportunities for meaningful interaction in the online learning environment;
- Encouraging students to learn from one another's perspectives;
- Preparing students to complete weekly quizzes and supporting continued learning growth; and
- Building foundational skills for the final research presentation.

To earn full credit (20 points per discussion), students must sufficiently respond to all discussion prompts in a manner that provides evidence that the student reviewed each model and understood the readings, videos and other resources provided. Discussion entries must include key terms covered and appropriate APA-style reference citations. A penalty will be assessed for responses that do not adequately address the discussion prompts or that do not provide evidence that the student read/reviewed all required materials in each module. Students are also required to respond to at least two (2) classmates' posts. When responding to peers, students are expected to maintain a high level of professionalism and contribute additional information or suggestions, citing materials covered in each module. It is fine to disagree and discuss alternative views, however incendiary (hostile, insulting, or disrespectful) online interactions or any other inappropriate posts will not be tolerated, and will receive zero credit.

All discussion responses are due by the date and time indicated on the course schedule. No credit will be given for late/missing posts. For more information, see the Discussion Board Instructions and Grading Rubric in Canvas. There are 7 discussion posts plus an introduction post (10pts) required during the course **(150 points; 30% of final grade).**

3. Lab (At-Home Demonstrations)

Students are required to complete four labs (at-home demonstrations) throughout the course. These activities are designed to help students gain hands-on experience with key concepts related to oceanography and meteorology. Each lab will involve simple experiments using readily available household materials to illustrate important principles discussed in the course. After completing each lab, students will:

- **Record a video** of the demonstration process, including a clear explanation of the steps taken and the results observed.
- **Write a summary** of the experiment, including the objective, materials used, procedure, observations, and a brief explanation connecting the results to the course concepts. The summary should also include responses to specific questions provided in the lab instructions.
- **Upload the video** and **written report** to the assignment submission portal in Canvas by the due date indicated on the course schedule.
- **Participate in the discussion** related to the demonstration, sharing insights and responding to at least two peer submissions to compare and contrast results and interpretations.

To earn full credit (20 points per lab), students must demonstrate a thorough understanding of the experiment, accurately follow the procedure, and thoughtfully connect their observations to course material. Videos and reports must be clear, well-organized, and professionally presented. There are 5 Lab activities (At-Home Demonstrations) during the course **(100 total points; 20% of final grade).**
**Additional lab activities may be assigned if needed to support learning objectives.*

4. Quizzes
Weekly quizzes will cover the required readings from the modules, assigned videos, and other online resources, as well as include information from course discussions. Quiz dates are indicated in the course schedule. There are 13 quizzes, each worth 15 points **(195 total points; 20% of final grade).**

5. Research Presentation
An important component of this course involves applying theory and research learned through course readings, videos, discussions, and lab experiences to a real-world topic of interest. Students will demonstrate their understanding by integrating course concepts into a final recorded presentation as well as review one peer's presentation and provide course-based feedback **(100 points; 20% of final grade).**

Grading Structure

Assignments	%
Learning Growth Assessment: 65pts	**10**
Discussions: 7 @ 20pts (plus 10pts for intro) = 150pts	**30**
Lab (At-Home Demonstrations): 5 @ 20pts = 100pts	**20**
Quizzes: 13 @ 15pts = 195pts	**20**
Final Presentation / Peer Review: 100pts	**20**
Total	**100%**

Grading Scale

A - (90% or higher)
B - (80 - 89%)
C - (70 - 79%)
D - (60 - 69%)
F - (Below 60%)

***Last Day to Withdraw from the courses: Monday, 30 March 2026**

Assignment Submission Policies and Late Work Guidelines

Assignment Submission Policies: All assignments are due on or before the dates indicated in the course modules in Canvas. Each written assignment must be typewritten and submitted in Canvas by the student. No email attachments will be accepted unless arranged with the professor in advance. Submission deadlines are final, and access to submission links is removed once a deadline has passed.

Students are responsible for reviewing assignment instructions carefully and ensuring that all required components are submitted by the posted due dates. All course participation—including discussions, quizzes, labs, and the final presentation—must be completed within Canvas. Uploaded documents and videos that do not open or are not viewable will receive 0 credit. It is the responsibility of the student to ensure that all submitted files are accessible and viewable after submission.

Late Work Guidelines and Make-Up Exams: NO LATE assignments will be accepted unless a valid, pre-approved reason or documented medical necessity has been discussed with the professor ahead of time. If an assignment cannot be completed on time due to a documented illness, funeral, or university-related activity, a make-up date may be scheduled with the professor. All late or non-submitted assignments will receive a score of zero. Students who miss a quiz or exam due to documented circumstances must contact the professor as soon as possible to arrange a make-up opportunity.

Course Policies and Expectations

Canvas: Students will access all components of the course through Canvas. Any changes to the course schedule, assignments, or special instructions will be posted on Canvas. Students are expected to check Canvas regularly for updates, review weekly modules, and download class materials as needed. Active online participation is essential for success in this course. Students should remain engaged throughout the week by reviewing course content, checking email, and contributing to discussions and assignments.

Technology Expectations: Students must ensure they have reliable internet access and the ability to upload documents and videos directly to Canvas. Students are responsible for verifying that all submissions are accessible after uploading.

Communication: Students are expected to communicate respectfully and professionally with classmates and the instructor. All course-related questions should be submitted through Canvas or university email. Students should monitor their email and Canvas notifications consistently for important course updates.

Active Participation: In an online environment, active participation (attendance) is measured by each student's online presence in the course learning environment (Canvas) as well as completion of assigned activities. **The Canvas system records time spent on pages, etc.** The importance of regular logins and active participation cannot be overstated. Participation is gauged by regular, on-time discussion forum postings and responses as well as contributions to peer review.

Academic Dishonesty: To be successful in this class, students must invest time in studying. Honesty is expected. Academic dishonesty (cheating, plagiarism, collusion) will NOT be tolerated and will result in a grade of zero (0) for the assignment. A second infraction will result in automatic failure of the class. Dishonesty is defined as (i) the use of unauthorized materials, (ii) any communication with peers during quizzes, (iii) representing another's work as one's own (i.e., plagiarism) or (iv) fabricating information. The professor reserves the right to determine occurrences of cheating. Additional information on Academic Dishonesty is found in the University Policies included in Canvas.

Artificial Intelligence (AI) Policy—UT Tyler Policy on Artificial Intelligence

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussion of AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI must be acknowledged, as this aligns with our commitment to honor and integrity outlined in UT Tyler's Honor Code. Students must not use protected information, private data, or copyrighted materials when using any AI tool.

Users should be aware that AI tools rely on predictive models to generate content that may appear correct but can be incomplete, inaccurate, taken without attribution, and/or biased. AI tools should not be considered substitutes for traditional approaches to research. Students are ultimately responsible for the quality, accuracy, and integrity of all submitted work. Misusing AI tools in ways that violate the guidelines specified for this course (see below) is considered a breach of academic integrity and will result in disciplinary actions as outlined in UT Tyler's Academic Integrity Policy.

Course-Specific AI Expectations

Artificial intelligence (AI) tools—such as ChatGPT, Claude, Google Gemini, and similar platforms—can support learning, but they must be used ethically, responsibly, and in ways that enhance your thinking rather than replace it. In this course, all submitted work must reflect **your own** understanding of oceanography and meteorology, developed through readings, videos, labs, discussions, and assignments.

Allowed Uses of AI

Students may use AI **only for the following purposes:**

- Clarifying concepts you do not understand after completing the assigned readings or videos.
- Checking grammar, spelling, or clarity in your writing (AI may not generate substantive content).
- Brainstorming ideas *after* you have written your initial draft.
- Practicing explanations of scientific ideas to support learning, not to produce graded work.

If you use AI for these acceptable purposes, all ideas and wording in the final submitted work must still be your own.

Prohibited Uses of AI

AI may **NOT** be used to:

- Write any part of your **discussion posts**, **lab summaries**, or your **final research presentation; obtain answers to quizzes.**
- Generate explanations, summaries, analyses, or descriptions of course materials
- Create citations, references, or scientific evidence
- Produce entire paragraphs, outlines, or scripts for any graded assignment
- Generate lab results, observations, interpretations, or data
- Respond to classmates in discussion forums
- Introduce terminology, concepts, or key words that are not part of the course and that extend beyond the scope of what is taught or assigned

Submitting AI-generated content as your own is a violation of academic integrity.

How AI Misuse Will Be Identified

AI-generated work often shows recognizable patterns, including:

- Generic, vague, or overly polished explanations
- Citations that do not exist, cannot be verified, or are inaccurate
- Statements that contradict course readings or scientific accuracy
- Disconnection from your own lab work, video submissions, or prior writing

- **Use of advanced terminology, unfamiliar phrasing, or key concepts that have not been taught in the course and do not match your demonstrated writing level**

If an assignment is suspected to contain AI-generated content, you may be asked to:

1. Explain your reasoning or thought process for the submitted work
2. Discuss the scientific concepts without AI assistance
3. Revise and resubmit the assignment without AI use

Consequences of AI Misuse

Submitting AI-generated work as your own constitutes academic dishonesty and will result in:

- A **zero** on the assignment, and
- A report filed with the university under the Academic Integrity Policy

Repeated violations may result in failure of the course.

If You Use AI Appropriately

If you use AI within the permitted guidelines, include this required acknowledgment at the end of your assignment:

"AI assistance was used only for grammar/clarity review and not for generating ideas or content."

Tips for Success in this Course

1. **Participate.** I invite you to engage deeply, ask questions, and talk about the course content with your classmates and with me. You can learn a great deal from discussing ideas and perspectives with your peers and professor. Participation can also help you articulate your thoughts and develop critical thinking skills.
2. **Manage your time.** I get it—students usually juggle a lot, and I know you've got commitments beyond this class. Still, doing your best often means carving out enough dedicated time for coursework. Try scheduling specific blocks of time and ensure you have enough room to finish assignments, allowing extra space for any tech issues that might pop up.
3. **Login regularly.** I recommend that you log in to Canvas several times a week to view announcements, discussion posts and replies to your posts.
4. **Do not fall behind.** This class moves at a quick pace and each week builds on the previous class content. If you feel you are starting to fall behind, check in with me as soon as possible so we can troubleshoot together. It will be hard to keep up with the course content if you fall behind in the pre-work or post-work.
5. **Use Canvas notification settings.** Pro tip! Canvas can ensure you receive timely notifications in your email or via text. Be sure to enable notifications to be sent instantly or daily. (Canvas Notification Guide)
6. **Ask for help if needed.** If you are struggling with a course concept, reach out to me and your classmates for support.

University Policies & Student Resources:

University policies and student resources are available on the University website and in Canvas under "Syllabus".

- University Policy
- Student Resources