

## Syllabus for Introduction to Atmospheric Dynamics (ATMO 303)

*Attention: this is NOT the final version of the syllabus. Minor changes may be made until the first class (August 24, 2026).*

**Time:** Fall 2026, MW, 2:30-3:45 am

**Location:** HIG 310

**Instructor:** Dr. Hongwei Sun, HIG 340, [hongwei8@hawaii.edu](mailto:hongwei8@hawaii.edu)

**Office Hours:** TBD (by appointment?)

**Prerequisites:** MET302, MATH242, and PHYS272

**Text:** *An Introduction to Dynamics Meteorology*, by James R. Holton and Gregory J. Hakim, Academic Press, 5nd Edition, 2012, 553pp, ISBN 978-0-12-384866-6 (hardback)

**Course description:** This course is a quantitative introduction to the fundamentals for modern dynamic meteorology. The emphasis is focus on the physical principle rather than mathematical elegance. It provides an elementary description and interpretation of the large-scale atmospheric motions that are associated with weather and climate. Topics to be studied include: the basic conservation laws and its applications of the basic equations, spherical and Cartesian coordinates, pressure ( $p$ ) and potential temperature ( $\theta$ ) vertical coordinates, thermal and gradient winds, circulation and vorticity in the atmosphere.

### Grading:

- Quiz/Homework: 40%
- Midterm exam: 30%
- Final exam: 30%

Grading Scale	
100-90	A
89-80	B
79-70	C
69-60	D
Below 60	F

A focused effort is essential to understanding the material in class. You are encouraged to work together for homework, but you are not allowed to copy each other.

Claiming someone else's work or ideas as your own constitutes academic dishonesty. Such behavior will not be tolerated and may result in serious consequences, including an unsatisfactory outcome.

Quiz/Homework and exams will contribute to grades as indicated in the table above on the left.

**Weather information web sites:**

University of Hawaii Meteorology weather Server

<http://weather.hawaii.edu>

The Marshall Spaceflight Center's GOES Satellite viewer:

<https://weather.ndc.nasa.gov/goes/>

<https://www.star.nesdis.noaa.gov/goes/>

And the NCEP web-based surface weather analysis:

<http://www.wpc.ncep.noaa.gov/html/sfc2.shtml>

**Student Learning Outcomes:**

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

- Apply physical laws and forces in initial and non-initial frame coordinates to explain the circular motions in the atmosphere of the rotating earth.
- Describe the balanced winds (such as geostrophic wind, thermal wind, and gradient wind), circulation and vorticity in the earth's atmosphere

**Schedule for ATMO303 (Fall 2026):**

	<b>Mon</b>	<b>Wed</b>	
<b>Week 1</b>	Aug 24	Aug 26	
<b>Week 2</b>	Aug 31	Sep 2	
<b>Week 3</b>	<del>Sep 7</del> (HOLIDAY: Labor Day)	Sep 9	
<b>Week 4</b>	Sep 14	Sep 16	
<b>Week 5</b>	Sep 21	Sep 23	
<b>Week 6</b>	Sep 28	Sep 30	
<b>Week 7</b>	Oct 5	Oct 7	
<b>Week 8</b>	Oct 12	Oct 14	
<b>Week 9</b>	Oct 19	Oct 21	
<b>Week 10</b>	Oct 26	Oct 28	
<b>Week 11</b>	Nov 2	Nov 4	
<b>Week 12</b>	Nov 9	<del>Nov 11</del> (HOLIDAY: Veterans Day)	
<b>Week 13</b>	Nov 16	Nov 18	
<b>Week 14</b>	Nov 23	<del>Nov 25</del> (may offer via Zoom)	November 26: Thanksgiving
<b>Week 15</b>	Nov 30	Dec 2	
<b>Week 16</b>	Dec 7	Dec 9	
<b>Week 17</b>	December 10: Last day of instruction December 11-12: Study Period December 14-18: Final Examination Period		