

# ATS 606 Introduction to Climate - Spring 2023

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**Programming TA:** Justin Hudson [Justin.Hudson@colostate.edu](mailto:Justin.Hudson@colostate.edu)

**Web:** Class webpage is available on Canvas. Please let me know if you have trouble. Class notes, homework, and discussion papers will be posted on this site.

**Class Schedule:** Class meets in 101 ATS from 10 a.m.-10:50 a.m. Tue and Thur.

**Expected work outside the class:** At least 2 hours of effort are expected to complete the homework and computing assignments outside of class for each hour of class time.

**Student Learning Goals and Objectives:** The successful student will gain a broad graduate level process-oriented understanding of the Earth's climate system. The material will provide a strong foundation for further specialized study on the climate system that provides contributions to the peer-reviewed scientific literature.

**Textbooks:** No textbook will be required, and I will largely use my own notes for the course, which will be posted on Canvas. Three good references are: 1) *Global Physical Climatology*, by D.L. Hartmann (second edition); 2) *Atmospheric Science: An Introductory Survey*, by J. M. Wallace and P. V. Hobbs, Second Edition; 3) *Atmosphere, Ocean, and Climate Dynamics, An Introductory Text*, by John Marshall and Alan Plumb.

**Presentation of an AR6 FAQ:** In pairs of two, from the recent AR6 report, choose one FAQ or one section from a chapter. Present a) the problem or question, b) past and ongoing research efforts and c) open research questions and hypotheses in class (10-15min).

<https://www.ipcc.ch/report/ar6/wg1/>

**Grading:** +/- grades will be assigned for a final course grade.

First and second exam: each 25%

Presentation of AR6 topic: 10%

Homework assignments: 30%

Class Participation: 10%

No late homework assignments are accepted without prior approval.

## **Covid/absence:**

Please stay at home if you're sick and also if you're in doubt about having been in contact with sick people or if you don't feel comfortable in the classroom (in the latter case let me know). I will record classes upon prior request.

For the latest information about the University's COVID resources and information, including FAQs about the spring semester, please visit the **CSU COVID-19 site**

<https://covid.colostate.edu/>.

**Course Outline** \*most recent syllabus is on canvas\*

Date	W	Tuesday	Thursday	Deadlines
01/15-01/21	1	Climate system components, atmospheric temperature profile	Description of radiation	
01/22-01/28	2	Global energy balance	Global energy balance	
01/29-02/04	3	Radiative transfer	Radiative-convective equilibrium	HW1 radiation due Friday 02/03
02/05-02/11	4	Clouds in the energy budget	Clouds in the energy budget	Theme and partner for presentation due Friday 02/10
02/12-02/18	5	Surface energy balance	Surface energy balance	HW2 clouds due Friday 02/17
02/19-02/25	6	Hydrological cycle	Hydrological cycle	
02/26-03/04	7	Atmospheric circulation	Atmospheric circulation	HW3 surface energy and hydrology due Friday 03/03
03/05-03/11	8	Atmospheric circulation	<b>Exam 1 10-10:50</b>	
03/12-03/18		Spring break	Spring break	
03/19-03/25	9	Ocean circulation	Ocean circulation	
03/26-04/01	10	Ocean and sea ice	Sea ice	HW4 atmosphere and ocean due Friday 03/31
04/02-04/08	11	Climate variability	Climate variability	
04/09-04/15	12	Radiative feedbacks and climate sensitivity	Land-climate interaction	
04/16-04/22	13	Land-climate interaction	<b>Exam 2 10-10:50</b>	
04/23-04/29	14	Climate change in the 20 <sup>th</sup> century	Climate change in the 21 <sup>st</sup> century	
04/30-05/06	15	student AR6 presentations	student AR6 presentations	HW5 climate change due Friday 05/05

**Statement on Academic Integrity:**

This course will adhere to the CSU Academic Integrity Policy as found in the General Catalog (<http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/#academic-integrity>) and the Student Conduct Code (<https://resolutioncenter.colostate.edu/conduct-code/>). At a minimum, violations will result in a grading penalty in this course and a report to the Conflict Resolution Services and Student Conduct Services.

**CSU Atmospheric Science promotes inclusive community:**

CSU Atmospheric Science is a leading global institution, and as such, all members of our community regardless of race, ethnicity, culture, religion, sexual orientation, gender identity and expression, physical ability, age, socioeconomic status or nationality are welcome as equal contributors. We value and appreciate diversity, and we believe that diversity on our campus strengthens our entire scientific community.