

# ATS 150: GLOBAL CLIMATE CHANGE

SPRING 2025: IN-PERSON

## GUARANTEED TRANSFER PATHWAYS DESIGNATION:

The Colorado Commission on Higher Education has approved **ATS 150** for inclusion in the Guaranteed Transfer (GT) Pathways program in the **GT-SC2** category. For transferring students, successful completion with a minimum C– grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to <https://cdhe.colorado.gov/guaranteed-transfer-gt-pathways-general-education-curriculum>

<b>Content Criteria</b> Content Competencies pertain to the knowledge base, methods, concepts, and content-related learning that students should garner from participation in a course. Students should be able to demonstrate acquisition of such content-focused learning as a result of participation in courses in each category of the AUCC.	<b>Core Student Learning Outcomes</b> Core Student Learning Outcomes are transferable skills that students garner in a variety of educational settings and that have wide applicability across fields and in life.
<p>The <b>lecture</b> content of a science course:</p> <ol style="list-style-type: none"> <li>Develop foundational knowledge in specific field(s) of science.</li> <li>Develop an understanding of the nature and process of science.</li> <li>Demonstrate the ability to use scientific methodologies.</li> <li>Examine quantitative approaches to study natural phenomena.</li> <li>Develop concepts of accuracy, precision, and the role of repeatability in the acquisition of scientific knowledge.</li> <li>Develop connections between the specific subject matter being taught and other areas of scientific endeavor or human activity.</li> </ol> <p>The <b>laboratory</b> (either a combined lecture and laboratory, or a separate laboratory tied to a science lecture course) content of a science course:</p> <ol style="list-style-type: none"> <li>Perform hands-on activities with demonstration and simulation components playing a secondary role.</li> <li>Engage in inquiry-based activities.</li> <li>Demonstrate the ability to use the scientific method.</li> <li>Obtain and interpret data and communicate the results of inquiry.</li> <li>Demonstrate proper technique and safe practices.</li> </ol>	<p><u><i>Inquiry &amp; Analysis</i></u></p> <ol style="list-style-type: none"> <li><b>Select or Develop a Design Process</b> <ol style="list-style-type: none"> <li>Select or develop elements of the methodology or theoretical framework to solve problems in a given discipline.</li> </ol> </li> <li><b>Analyze and Interpret Evidence</b> <ol style="list-style-type: none"> <li>Examine evidence to identify patterns, differences, similarities, limitations, and/or implications related to the focus.</li> <li>Utilize multiple representations to interpret the data.</li> </ol> </li> <li><b>Draw Conclusions</b> <ol style="list-style-type: none"> <li>State a conclusion based on findings.</li> </ol> </li> </ol> <p><u><i>Quantitative Literacy</i></u></p> <ol style="list-style-type: none"> <li><b>Interpret Information</b> <ol style="list-style-type: none"> <li>Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).</li> </ol> </li> <li><b>Represent Information</b> <ol style="list-style-type: none"> <li>Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).</li> </ol> </li> </ol>

**COURSE READINGS: NO REQUIRED TEXTBOOK. READINGS AVAILABLE ON CANVAS.**

**PREREQUISITES: NONE**



## INSTRUCTOR INFORMATION

Instructor: Scott Denning ([Scott.Denning@colostate.edu](mailto:Scott.Denning@colostate.edu))

Graduate Teaching Assistant: Sarah Venegas ([Sarah.Venegas@colostate.edu](mailto:Sarah.Venegas@colostate.edu))

### **Communication Policy:**

Please contact us on Canvas using the CHAT feature or use email at the addresses above. We will respond within 24 hours. If you need to request an extension for homework, please email at least 24 hours in advance.

## COURSE DESCRIPTION & OBJECTIVES

We'll answer the three most important questions about climate change. **I call these the Three S's of Climate Change:**

- **SIMPLE: How does it work?**
- **SERIOUS: How bad will it get?**
- **SOLVABLE: What are we going to do about it?**

*I promise this course will not crush your soul!* Most of the material you've seen is probably focused on the middle **S** (Serious). It *is* deadly serious! But there's no point obsessing about how bad things could get, so we cleverly sandwich the middle **S** between the other two critical pieces, giving them all roughly equal time and attention. We will spend about five weeks on each **S**. By the end of the course, I hope you will agree that preventing global catastrophe is definitely feasible and requires fundamental changes that will make the world a better place. It's inspiring!

Upon the completion of this course, students will be able to:

1. Describe how changes in radiation balance affect Earth's climate
2. Define and enumerate physical bases for climate forcing, feedback, and sensitivity
3. Calculate the relationships among emissions, CO<sub>2</sub>, and warming
4. Describe the principles, strengths, & weaknesses of global climate models
5. Explain the use of emission scenarios and climate projections
6. Identify impacts of climate change on ecosystems and society
7. Articulate the structure of and critique economic analyses of climate change
8. Compare technical & policy approaches to climate mitigation & adaptation
9. Identify key opportunities for decarbonizing the world's economy
10. Think carefully about how YOU can help build a better world!



## COURSE MODULES

The course is divided into three units of weekly modules. Each module includes readings, videos, a written assignment, and a quick quiz. The idea is to reduce stress by including many low-stakes assessments and avoid having the final grade depend on just a big mid-term and final exam.

### Module 1: Simple Serious Solvable

#### SIMPLE: CLIMATE CHANGE MECHANISMS

- Module 2: Energy and Radiation
- Module 3: How Climate Works
- Module 4: Forcing, Feedback, and Sensitivity
- Module 5: Climate Change of the Past

#### SERIOUS: WHY CLIMATE CHANGE SUCKS

- Module 6: Observed Climate Change and Impacts
- Module 7: Climate Modeling
- Module 8: Future Climate Change and Impacts
- Module 9: Fate of Fossil CO<sub>2</sub>

#### SOLVABLE: WHAT WE'RE GOING TO DO ABOUT IT

- Module 10: Carbon Economics
- Module 11: Social Cost of Carbon
- Module 12: Climate Change Policy
- Module 13: Deep Decarbonization
- Module 14: Cleaning Up the Mess

### Module 15: Building a Better World

## COURSE MATERIALS & EQUIPMENT

We will use custom web-based interactive models developed for the class, so you need access to a desktop computer, laptop, or tablet.

## PARTICIPATION/BEHAVIORAL EXPECTATIONS

IMPORTANT: You *really* have to **keep up with the course and do the assignments** to succeed! Written assignments and weekly quizzes count for 55% of the semester grade. You should expect

to spend at least two hours per week viewing the online materials and an additional two to four hours per week doing readings and homework assignments.

## COURSE POLICIES (ATTENDANCE, GROUP TEXT, LATE ASSIGNMENTS, EXAMS)

### **ATTENDANCE IN CLASS IS MANDATORY!**

Remember how much you hated zoom classes during COVID? We want to form a community of learners this semester.

We will have in-class polling with iClicker. You will get participation points for answering the in-class polls, but you won't be penalized for wrong answers. These participation points will count 10% toward your final semester grade.

**Download the iClicker app** on your phone (iOS or Android), and join the class by clicking the following link: <https://join.iclicker.com/VAKO>

**GROUP TEXT:** We will use the CHAT feature in Canvas for homework help and real-time assistance as a GROUP TEXT. PLEASE look there to see if your HW question has already been asked and answered, and please feel free to answer one another on there.

Late assignments can be acceptable ONLY if you negotiate with us ***in advance***.

EXAMS and QUIZZES are all **open-book, open-notes, and online in Canvas**.

### **GRADING POLICY**

CSU does not use grades of C-, D+, or D-.

Grade	Range
A+	100% to 96.67%
A	<96.67% to 93.33%
A-	<93.33% to 90.0%
B+	<90.0% to 86.67%
B	<86.67% to 83.33%
B-	<83.33% to 80.0%
C+	<80.0% to 76.67%
C	<76.67% to 70.0%
D	<70.0% to 60.0%
F	<60.0% to 0.0%

As a student enrolled in this course, one of your responsibilities is to ***submit course work by the due dates listed in Canvas***. With that said, we take our roles as your instructors very seriously!

We really do care about how well you do in this course and that you have a satisfying, rewarding experience.

We commit to respond individually to the work you submit in this class and to return your work in a timely manner. Weekly assignments will be graded within one week.

ASSIGNMENT	GRADE PERCENTAGE
In-Class Polling with iClicker	10
Weekly Quizzes	20
Weekly graded assignments	35
Three open-book examinations	35
<b>Total:</b>	<b>100 %</b>

\*Keep a copy of all work created for the course, including work submitted through Canvas

## CANVAS INFORMATION & TECHNICAL SUPPORT

Canvas is where course content, grades, and communication will reside for this course.

- [Login for Canvas](#)
- [Canvas Support](#)
- For passwords or any other computer-related technical support, contact the [Central IT Technical Support Help Desk](#). (970) 491-7276 [help@colostate.edu](mailto:help@colostate.edu)

The [Technical Requirements](#) page identifies the browsers, operating systems, and plugins that work best with Canvas. If you are new to Canvas quickly review [the Canvas Student Orientation](#) materials.

## ACADEMIC INTEGRITY & CSU HONOR PLEDGE

This course will adhere to the CSU [Academic Integrity/Misconduct](#) policy as found in the General Catalog and the [Student Conduct Code](#).

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course.

Further information about Academic Integrity is available at CSU's [Academic Integrity - Student Resources](#).

## UNIVERSAL DESIGN FOR LEARNING/ACCOMMODATION OF NEEDS



I am committed to the principle of universal learning. This means that our classroom, our virtual spaces, our practices, and our interactions be as inclusive as possible. Mutual respect, civility, and the ability to listen and observe others carefully are crucial to universal learning.

If you are a student who will need accommodations in this class, please contact me to discuss your individual needs. Any accommodation must be discussed in a timely manner. A verifying memo from [The Student Disability Center](#) may be required before any accommodation is provided.

The Student Disability Center (SDC) has the authority to verify and confirm the eligibility of students with disabilities for the majority of accommodations. While some accommodations may be provided by other departments, a student is not automatically eligible for those accommodations unless their disability can be verified and the need for the accommodation confirmed, either through SDC or through acceptable means defined by the particular department. Faculty and staff may consult with the SDC staff whenever there is doubt as to the appropriateness of an accommodative request by a student with a disability.

The goal of SDC is to normalize disability as part of the culture of diversity at Colorado State University. The characteristic of having a disability simply provides the basis of the support that is available to students. The goal is to ensure students with disabilities have the opportunity to be as successful as they have the capability to be.

Support and services are offered to student with functional limitations due to visual, hearing, learning, or mobility disabilities as well as to students who have specific physical or mental health conditions due to epilepsy, diabetes, asthma, AIDS, psychiatric diagnoses, etc. Students who are temporarily disabled are also eligible for support and assistance.

Any student who is enrolled at CSU, and who self-identifies with SDC as having a disability, is eligible for support from SDC. Specific accommodations are determined individually for each student and must be supported by appropriate documentation and/or evaluation of needs consistent with a particular type of disability. SDC reserves the right to ask for any appropriate documentation of disability in order to determine a student's eligibility for accommodations as well as in support for specific accommodative requests. The accommodative process begins once a student meets with an accommodations specialist in the SDC.

### THIRD-PARTY TOOLS/PRIVACY

Please note that this course may require you to use third-party tools (tools outside of the Canvas learning management system), such as Skype and others. Some of these tools may collect and share information about their users. Because your privacy is important, you are encouraged to

consult the privacy policies for any third-party tools in this course so that you are aware of how your personal information is collected, used and shared.

## COPYRIGHTED COURSE MATERIALS

Please do not share material from this course in online, print, or other media. Course material is the property of the instructor who developed the course. Materials authored by third parties and used in the course are also subject to copyright protections. Posting course materials on external sites (commercial or not) violates both copyright law and the CSU Student Conduct Code. Students who share course content without the instructor's express permission, including with online sites that post materials to sell to other students, could face appropriate disciplinary or legal action.

## UNDOCUMENTED STUDENT SUPPORT

Any CSU student who faces challenges or hardships due to their legal status in the United States and believes that it may impact their academic performance in this course is encouraged to visit [Student Support Services for Undocumented, DACA & ASSET](#) for resources and support. Additionally, only if you feel comfortable, please notify your professor so they may pass along any additional resources they may possess.

## TITLE IX/INTERPERSONAL VIOLENCE

For the full statement regarding role and responsibilities about reporting harassment, sexual harassment, sexual misconduct, domestic violence, dating violence, stalking, and the retaliation policy please go to: [Title IX – Sexual Assault, Sexual Violence, Sexual Harassment](#).

If you feel that your rights have been compromised at CSU, several resources are available to assist:

- Student Resolution Center, 200 Lory Student Center, 491-7165
- Office of Equal Opportunity, 101 Student Services, 491-5836

A note about interpersonal violence: If you or someone you know has experienced sexual assault, relationship violence and/or stalking, know that you are not alone. As instructors, we are required by law to notify university officials about disclosures related to interpersonal violence. Confidential victim advocates are available 24 hours a day, 365 days a year to provide support related to the emotional, physical, physiological and legal aftermath of interpersonal violence. Contact the Victim Assistance Team at: 970-492-4242.

## RELIGIOUS OBSERVANCES

CSU does not discriminate on the basis of religion. Reasonable accommodation should be made to allow individuals to observe their established religious holidays. Students seeking an exemption from attending class or completing assigned course work for a religious holiday will need to fill out the [Religious Accommodation Request Form](#) and turn it in to the Division of Student Affairs, located on the second level of the Administration building.

Once turned in, the Division of Student Affairs will review the request and contact the student accordingly. If approved, the student will receive a memo from the Dean of Students to give to their professor or course instructor.

Students are asked to turn in the request forms as soon as the conflict is noticed. Similarly, unanticipated conflicts requiring a religious observance, such as a death in the family, can also be reviewed.

## CSU PRINCIPLES OF COMMUNITY

**Inclusion:** We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.

**Integrity:** We are accountable for our actions and will act ethically and honestly in all our interactions.

**Respect:** We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.

**Service:** We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

**Social Justice:** We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

## DIVERSITY AND INCLUSION

The [Mission, Vision, and Focus](#) webpage of the Vice President for Diversity includes a comprehensive statement of CSU's commitment to diversity and inclusion.