

## **ATS 680A7, Experimental Course for Fall 2025**

### **The Global Nitrogen Cycle**

*Instructor:* Emily Fischer

Monday/Wednesday, 10 – 10:50AM, 121 ATS West

*Office Location:* Atmospheric Science Building, Room 203

*Phone/Email:* emily.v.fischer@colostate.edu

*Office Hours:* By Appointment.

*Course Description:* This course is focused on understanding the processes that regulate the cycling of nitrogen among and between the atmosphere, oceans and continents. Special emphasis will be placed on the role of the atmosphere in the global nitrogen cycle and how the global nitrogen cycle has changed due to human activities. The course will largely be structured as 1 lecture per week and 1 discussion period. Students will lead and participate in weekly discussions on topic-relevant literature. As a final project, each student will prepare a research proposal choice related to the course material and agriculture. The class will also review these proposals.

*Course Learning Objectives:*

1. Describe the forms and cycling of nitrogen in the atmosphere and other global reservoirs.
2. Critique current literature focused on the nitrogen cycle with a focus on the atmosphere.
3. Effectively summarize and facilitate discussions focused on recent literature related to the global nitrogen budget.
4. Develop and review research proposals focused on reactive nitrogen.

*Prerequisites:* ATS 621, or equivalent chemistry class experience, or permission of the instructor.

*Grading:* The overall course grade will be made up of three different components: active in-class participation in the discussions (50%) and the development of a research proposal (30%), and the review of other research proposals (20%) related to course content.

*Grading criteria for discussion participation:*

Grade	Criteria
F	<ul style="list-style-type: none"> <li>• Does not participate.</li> </ul>
D	<ul style="list-style-type: none"> <li>• Present, not disruptive.</li> <li>• Tries to respond when called on but does not offer much.</li> <li>• Demonstrates very infrequent involvement in discussion.</li> </ul>
C	<ul style="list-style-type: none"> <li>• Demonstrates adequate preparation: knows the basics of the assigned journal articles, but does not show evidence of trying to interpret them.</li> <li>• Offers straightforward information (e.g., straight from the reading), without elaboration or very infrequently.</li> <li>• Does not offer to contribute to discussion, but contributes to a moderate degree when called on.</li> <li>• Demonstrates sporadic involvement in the discussions.</li> <li>• Alternatively, student participates but in a problematic way: talks too much, rambles, or interrupts others.</li> </ul>
B	<ul style="list-style-type: none"> <li>• Demonstrates good preparation: knows paper conclusions well, and has thought through their implications.</li> <li>• Offers interpretations and analysis of the papers (more than just repeating the author's analysis) to class.</li> <li>• Contributes well to discussion in an ongoing way: responds to other students' points, thinks through own points, questions others in a constructive way</li> <li>• Demonstrates consistent ongoing involvement.</li> </ul>
A	<ul style="list-style-type: none"> <li>• Student comes to class prepared and contributes readily to the conversation but does not dominate it.</li> <li>• Demonstrates excellent preparation: has analyzed assigned readings thoroughly, can relate papers to each other, and identify inconsistencies or questions.</li> <li>• Offers analysis, synthesis, and evaluation of assigned journal articles, e.g., combines pieces of the discussion to further the group's understanding of material.</li> <li>• Contributes in a very significant way to ongoing discussion: keeps analysis focused, responds very thoughtfully to other students' comments, enhances other's understanding by contributing to cooperative arguments/problem solving, suggests alternative ways of explaining difficult material</li> <li>• Demonstrates ongoing very active involvement.</li> </ul>

*Statement on Academic Integrity:* This course will adhere to the CSU Academic Integrity Policy as found in the General Catalog (<http://www.catalog.colostate.edu/FrontPDF/1.6POLICIES1112f.pdf>) and the Student Conduct Code (<http://www.conflictresolution.colostate.edu/conduct-code>). At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.

*Contact Hours:* 2 (At least 3 hours of effort are expected to complete reading and associated activities outside of class for each hour of class time.)