

ATS 781, Experimental Course for Fall 2018 Aircraft Observations

Instructor: Prof. Emily Fischer

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Office Hours: By Appointment

Course Description: Aircraft observations of trace species and meteorological parameters are an essential part of atmospheric studies. The NSF/NCAR C-130 is an atmospheric science research platform. This course will provide 1) exposure to mission design and flight planning to test specific hypotheses with a given payload, 2) experience working in teams to interpret experimental data from multiple instruments, and 3) information on best practices in experimental strategies and procedures. Students will actively plan two reduced payload short flights on the NSF/NCAR C-130, with the option of participating in one flight in a “shadowing” role. Students will be responsible for the subsequent analysis of the data. Students will also jointly produce a series of short videos that will either demonstrate best practices for tasks that are not often taught formerly related to aircraft observations, or effectively communicate their research. These videos can include Q&A and demonstrations by NCAR scientists. We plan to house these videos on the NCAR website.

Course Learning Objectives: Upon completion of this class students will

1. Explain key aspects of aircraft mission design and flight planning
2. Interpret a small suite of aircraft observations and present the results
3. Design an educational video relevant for graduate education or the public.

Prerequisites: Students are expected to have a familiarity with the basics of atmospheric chemistry (pre-requisite ATS 621 or equivalent), which will not be covered in this class. In addition, students are expected to have a basic familiarity with programming. Students are free to use their language of choice (*e.g.*, Matlab, IDL, IGOR, R, Python) for assignments.

Course Structure and Grading Criteria: The flights on the NCAR/NSF C-130 will occur in the following time window: 3 – 14 September 2018. We anticipate 2-3 flights of 2-3 hours duration. Students must be able to commit to participating in this aspect of the course in order to participate in the course. There will be at least 4 trips to the aircraft hangar between 3 – 14 September 2018. Students will be off campus between 8:30 and 4:30 on these days.

Grades are weighted as follows:

Participation in Research Flights and Associated Flight Planning: 40%

Presentation and Science Team Meeting Discussion: 20%

Poster Presentation: 20%%

Delivery of Educational Video: 20%%

Grading criteria for participation in research flights, associated flight planning and science team meetings:

Grade	Criteria
F	<ul style="list-style-type: none"> • Does not participate.
D	<ul style="list-style-type: none"> • Present, not disruptive. • Tries to respond when called on but does not offer much. • Demonstrates very infrequent involvement in discussion.
C	<ul style="list-style-type: none"> • Demonstrates adequate preparation: knows the basics of any assigned reading, but does not show evidence of trying to interpret or apply information • Offers straightforward information (e.g., straight from the lecture or reading), without elaboration or very infrequently. • Does not offer to contribute to discussion, but contributes to a moderate degree when called on. • Demonstrates sporadic involvement in the discussions. • Alternatively, student participates but in a problematic way: talks too much, rambles, or interrupts others.
B	<ul style="list-style-type: none"> • Demonstrates good preparation: has thought through the implications of lecture material and other resources. • Contributes well to discussion in an ongoing way: responds to other students' points, thinks through own points, questions others in a constructive way • Demonstrates consistent ongoing involvement.
A	<ul style="list-style-type: none"> • Student comes to class prepared and contributes readily to the conversation but does not dominate it. • Demonstrates excellent preparation: has sought out additional information other than that presented in class or lectures • Combines pieces of the discussion to further the group's understanding of goals. • 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 • Demonstrates ongoing very active involvement.

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: 3