Course title: Atmospheric and Oceanic Fluid Dynamics Laboratory

Term: Spring 2019; Mon 11:15-14:00; L1116 ES&T
(1 laboratory credit)

Instructors: Zachary Handlos and Taka Ito

Office Hours: By appointment

Reference text: Marshall J.C. and A. Plumb, Atmosphere, Ocean and Climate Dynamics, Academic Press.

Prerequisite: Atmospheric Dynamics (EAS4655) or Fluid Dynamics and Synoptic Meteorology (EAS6502) or Physical and Chemical Oceanography (EAS4305/6305)

Course Overview: The objective of this course is to develop skillsets in designing and conducting fluid experiments relevant to atmospheric and oceanic dynamics. Through the hands-on experience, the students are expected to deepen their knowledge in fundamental geophysical fluid dynamics and to become effective communicators of atmospheric, oceanic and climate dynamics in the context of teaching and public outreach.

Evaluation: homework (40%), term project presentation (20%), term project write-up (20%), attendance/participation*,** (20%)

*Absences for acceptable causes (attending job interviews, conferences, field work, medical appointments, etc) are not penalized.
** To receive full credit in the Attendance/Participation, students must perform hands-on demonstration in teaching/outreach opportunities including (1) the EAS booth at the Atlanta Science Festival or (2) in-class demonstration in relevant undergraduate courses.

Grading Scale
The **grading** for the course is as follows:

Grade	Percentage
A	100 – 90
B	89.99 – 80
C	79.99 – 70
D	69.99 – 60
F	<60

Depending on the distribution of student scores at the end of the course, the scores may be curved to reflect the scale described above (**up to the instructor's discretion**).

Tentative Schedule
The semester is broken into 6 modules. Students are organized into groups to perform assigned experiments. Each module takes approximately 2-3 weeks, and covers theory, experimental design, demonstration (by students), and write-up (homework). The write-ups emphasize on the experimental protocol, pedagogic summary of theory/observations, and plain language explanation. Students will design their own, original experiment/demonstration in the last module.

Part 1. Atmospheres (Module 1-3)

1. Taylor-Proudman theorem (dye stirring, hockey pack)
2. Differentially heated annulus (dishpan experiment, Hadley cell vs midlatitude waves)
3. Fronts and/or balanced vortex (thermal wind, gradient wind balance)

Part 2. Oceans (Module 4-5)

4. Ocean gyres (Ekman flow, beta-effect, Gulf Stream)
5. Thermohaline circulation (Stommel-Aron-Faller experiment, abyssal circulation)

Part 3. Student-led design project (Module 6)

Academic Honor Code
The instructor and students are expected to abide by Georgia Tech's Academic Honor Code. Plagiarism of any kind (including the reproduction of materials found on the internet) is strictly prohibited and will be reported to the Office of Dean of Students for academic misconduct. The complete text of the Academic Honor Code may be found at:
https://policylibrary.gatech.edu/student-affairs/academic-honor-code

Access and Accommodations
At Georgia Tech, we strive to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Office of Disability Services to explore reasonable accommodations.

The Office of Disability Services can be contacted by:
Phone: 404-894-2563
Email: dsinfo@gatech.edu
Website: http://disabilityservices.gatech.edu/

If our class meets at a campus location: Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.