

## **EAS 4801 — ATMOSPHERIC DYNAMICS PRACTICUM**

### **FALL 2012**

#### **PURPOSE OF THE COURSE:**

This laboratory course is designed for students to learn to use the meteorological analysis tools and hands on observation. This practicum provides students with an opportunity to connect historical and/or real-time weather events to principles presented in Atmospheric Dynamics EAS-4655 (or Introductory Fluid Dynamics and Synoptic Meteorology EAS-6502). Upon completion of this course, it is expected that students will have a greater physical understanding of how the atmosphere behaves and will be equipped to conduct diagnostic assessments of the atmosphere.

#### **INSTRUCTOR:**

Dr. James I. Belanger

ES&T Room 3170

Office Hours: Mondays 12–1PM; by appointment via email

Email: james.belanger@eas.gatech.edu

#### **LECTURE/LABORATORY SESSION:**

Mondays, 1:05-3:55 PM, ES&T 1221

#### **TEXTBOOK:**

*Midlatitude Synoptic Meteorology: Dynamics, Analysis, and Forecasting*

Gary Lackmann, American Meteorological Society

#### **GRADING:**

Your course grade will be determined from the following three components:

- 1) *Laboratory Reports (11 total; 50%)*
  - a. Students will have one week to complete each laboratory report, and these are to be turned in at the beginning of class. Late assignments will be automatically penalized 5% for each day that the assignment is late.
- 2) *Course Project/Case Study (30%)*
  - a. Students will complete a 'dynamical assessment' of a recent or historical weather event utilizing diagnostic tools that are presented during the semester.
  - b. Students will submit a written report in AMS/AGU style format and give an oral presentation (AMS/AGU Style: 12 minute presentation, 3 minutes for questions) on their study.
  - c. A case study proposal is due on *24 September 2012* and will consist of a summary of the event that will be analyzed and at least 2 peer-reviewed references that will also be included in the final report.
  - d. A working draft of the final report will be due *19 November 2012* and the instructor will return comments, revisions and feedback by 26 November 2012.
  - e. The due date for the final report is *3 December 2012*.
  - f. Additional details about the report and presentation will be discussed during class on 1 October 2012.
- 3) *Class Participation (20%)*
  - a. This includes active participation during the laboratory by either asking/answering questions or collaborating on the laboratory assignment with other students.

#### **ATTENDANCE:**

Laboratory attendance is mandatory. Although extenuating circumstances and institute-approved absences may prevent students from attending all laboratory sessions, students are expected to make every effort to attend. If an absence is necessary, students should alert the instructor PRIOR to the scheduled laboratory session.

#### **ACADEMIC HONOR CODE:**

The instructor and students are expected to abide by Georgia Tech's Academic Honor Code. For this course, collaboration on laboratory assignments is encouraged and expected. Often times it is this collaboration and group effort that results in better conceptual and physical understanding than simply working alone. However, students who plagiarize another student's laboratory report, which includes using previous semester course material, 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: <http://www.catalog.gatech.edu/rules/18b.php>

#### **TENTATIVE SCHEDULE OF LABORATORY SESSIONS:**

Week 1	Lab 1 – Introduction to meteorological tools
Week 2	Lab 2 – Interpreting Meteorological Data and Observations
	* Field Trip to the National Weather Service Office in Peachtree City. Weather balloon Launch and in-situ observations
Week 3	Georgia Tech Holiday, <i>No Lab</i>
Week 4	Lab 3 – Analysis and visualization of Surface and Upper-Air Data
Week 5	Lab 4 – Analysis and interpretation of Idealized Flow: Vorticity, Divergence, Deformation
Week 6	Lab 5 – Analysis and Interpretation of Horizontal Flow from an Extratropical Cyclone
Week 7	Lab 6: Case Studies
Week 8	Lab 7 – Temperature and Wind Field of a High Pressure System
Week 9	Georgia Tech Holiday: Fall Break, <i>No Lab</i>
Week 10	Lab 8 – Balanced Flows: Geostrophic/Gradient Flow; Thermal Wind
Week 11	Lab 9 – Vertical Stability Analysis; Conditional vs. Convective Instability
Week 12	Lab 10 – Cold Air Damming: Case Study in the Southeast U.S.
Week 13	Lab 11 – Quasi-Geostrophic Height Equation: Extratropical Cyclones
Week 14	Lab 12 – QG Omega Equation: Extratropical Cyclones
Week 15	Case Study Presentations

National Weather Service

Address: 4 Falcon Drive Peachtree City, GA 30269

Directions:

- Take I-85 South from Atlanta.
- Take Exit 61 for GA-74 toward Fairburn/Peachtree City.
- Turn left onto GA-74 S/Senoia Rd and continue to follow GA-74 S.
- After driving into Peachtree City, you will pass through the intersection of GA-74/GA-54.
- After a couple miles, turn right onto TDK Boulevard, then turn left onto Dividend Drive.
- Turn right onto Falcon Field Drive. The NWS office is the first driveway on the left.