ATM 401/501: Synoptic Laboratory II  
Spring 2019

Tu/Th: 4:15 – 5:35 pm in the Map Room (ES 333)

Instructor: Lance F. Bosart, ES 227  
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Office Hours: Tu/Th 1:30 – 3:00 pm  
Other times by appointment  
Map Room discussions anytime

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Office Hours: Mon/Wed 1:00 – 2:30 pm  
Other times by appointment

Course Objective:
Provide a capstone class for graduating atmospheric science majors that applies the fundamental theoretical principles of synoptic-dynamic meteorology to the real atmosphere through a discussion of ensemble weather forecasting, atmospheric predictability, applications of QG principles and PV thinking to weather analysis and forecasting, atmospheric analyses on subsynoptic to subseasonal time scales, and a capstone real-time severe weather and quantitative precipitation forecasting exercise.

Class Materials:
Handouts.  
Refereed literature.  
Web-based information.

Reference Materials:


ECMWF Media Resources: [https://www.ecmwf.int/en/about/media-centre/media-resources](https://www.ecmwf.int/en/about/media-centre/media-resources) (choose Newsletters)

Real Atmosphere (best of all)

**Course Structure:**
1. Problem sets  10%
2. Two exams  40% (20% each)
3. Two projects  40% (20% each)
   a) format: standard AMS journals (see class home page for details)
   b) length:  2000 words **maximum**
   c) deadline:  Th: 28 March 2019 (macroclimatology)
                  Tu: 30 April 2019 (weather analysis and forecasting)
4. Class participation in weather discussions:  10%
5. Class project presentations:  Day and time to be determined

**Forecasting:**
1. Temperature and precipitation.
2. Selected international cities that will rotate weekly.

**Course Outline:**
1. State-of-the-art of weather forecasting
2. Atmospheric predictability
3. Ensemble weather forecasting
4. Global macroclimatology
5. Application of QG principles and PV thinking to weather analysis and forecasting
6. Deep moist convection and severe weather forecasting
7. Real-time severe weather and quantitative precipitation forecasting (QPF) exercises