
ESS 1xx Weather and Meteorology

This course provides an overview of weather systems in midlatitudes and tropics. The fundamental dynamics responsible for these weather systems are described. Elementary weather analysis and forecasting techniques are introduced.

Instructor: Jin-Yi Yu

Grade: homework (30%), midterm (30%), final (40%)

Weeks 1 -5: Midlatitude Weather

- Week 1 - general circulation in the extratropics
jetstream and blocking
- Week 2 - midlatitude cyclone
structure and lifecycle
- Week 3 - cyclone dynamics
baroclinic instability and energy conversion
- Week 4 - front and related meso-scale phenomena
frontogenesis
- Week 5 - convection systems and clouds
instability, convective available potential energy, entrainment

***** mid-term *****

Weeks 6 -8: Tropical Weather

- Week 6 - wind systems of the tropics
low-level jet, trade winds, inter-tropical convergence zone, and monsoons
- Week 7 - tropical disturbance
equatorial wave theory
- Week 8 - tropical hurricane
structure, movement, and formation mechanisms

Weeks 9-10: weather analysis and forecasting techniques

- Week 9 - weather analysis techniques, weather map
real-world applications of basic dynamical principles.
- Week 10 - weather forecasting techniques
introduction to operational products and forecasting.

***** FINAL *****