

ATMOS 607 Mesoscale Meteorology

This course covers observational and theoretical aspects of mesoscale circulation systems and applications of these concepts for mesoscale analysis and prediction.

Text Book: None required

Course Outlines:

1. Definition of Mesoscale, Scale Analysis
2. Mesoscale Instabilities
3. Introduction to the Atmospheric Boundary Layer, Basic Equations
4. Thermally forced circulation; Flow interaction with topography
5. PBL in complex terrain, Gap winds
6. Mesoscale gravity waves, lee waves
7. Winds in the marine boundary layer
8. Low-level coastal jets, Barrier jets, Coastal trapped wind reversal
9. Tropical mesoscale and local circulations
10. Isallobaric winds, ageostrophic winds, and vertical motions
11. Dynamics & Microphysics of Cool-Season Orographic Storms, cold air damming
12. How mesoscale models work, How Models Produce Precipitation and Clouds
13. Understanding Assimilation Systems
14. Island-scale airflow and rainfall over the Hawaiian Islands under summer trade-wind conditions
15. High winds and localized heavy rainfall events over a subtropical island
16. Downscaling of NWP data

Grading: One mid-term (25%), a term paper (with oral presentation) on a topic jointly determined with the instructor and each student (20%), home work (15%), and a final examination (30%).

A Few References;

1. Mesoscale Atmospheric Circulations by Atkinson
2. Atmospheric Process over Complex Terrain by AMS
3. Mesoscale Analysis and Forecasting by AMS
4. Wallace and Hobbs, Chapter 9 and Holton's Book Chapter 5.
5. Mesoscale Meteorology in Midlatitudes by P Markowski and Y Richardson
6. COMET Modules in Mesoscale Meteorology, Mountain Meteorology, Coastal Weather and Numerical Weather Prediction

Title XI Statement:

The University of Hawai'i is committed to providing a learning, working and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking. If you or someone you know is experiencing any of these, the University has staff and resources on your campus to support and assist you. Staff can also direct you to resources that are in the community. Here are some of your options:

As members of the University faculty, your instructors are required to immediately report any incident of potential sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and your instructors cannot guarantee confidentiality, you will still have options about how your case will be handled. Our goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need.

If you wish to remain ANONYMOUS, speak with someone CONFIDENTIALLY, or would like to receive information and support in a CONFIDENTIAL setting, use the **confidential resources available here:**

<http://www.manoa.hawaii.edu/titleix/resources.html#confidential>

If you wish to directly REPORT an incident of sex discrimination or gender-based violence including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence or stalking as well as receive information and support,

contact: Dee Uwono Title IX Coordinator (808) 956-2299 t9uhm@hawaii.edu.