**ATM 110 syllabus**

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| **Week** | **Lecture Topics** | **Laboratory Topics** |
|     1 | **Introduction –**Problems of forecasting**Observing systems:**   In situ& remote    Surface Obs   RAOBs  |  Explore dataweb sites, METARS  |
|   2 | **Observing systems:**   Radar, Profilers       Satellites:  types, uses |  - Radars- Catalogue satellite types, orbits and instruments.  |
|   3 |  **Objective analysis and numerical modeling****Vertical analyses:**   Hydrostatic computations   Skew-T log-P diagram  |  - Mesoscale models- Model products  |
|  4 |  **Moisture variables, instability, inversion, stability indices**  |  - Sounding analysis, static stability |
|   5 |  **Horizontal analyses:**   Surface and upper air maps   Fronts, cloud types, precipitation |  -  Find and explore analyses-  examine thickness, vorticity, precipitable water, LI and K index maps  |
|    6 |  **Wind, pressure and force balances**   Horizontal pressure gradient   Coriolis force   Centrifugal force   Balanced winds   Conservation of Angular Momentum  |  - compute geostrophic winds- compute gradient winds  - Rotational properties and  kinematics |
|    7 |   **Derived quantities:**   Advection   Divergence   Vorticity   Vertical velocity  |  - Streamlines and trajectories  |
|   8 | **Cyclogenesis****Fronts** |  - Identifying regions of thermaladvection.- Quantifying estimates ofvorticity advection  |
|  9 |  **Local severe weather**   Thunderstorms   Lightning                      Tornadoes   Dry line  |  - Comparing vertical velocity patterns with thermal andvorticity advections- Phase velocities and Rossbywaves |
|  10 |  **Tropical cyclones**  |  -Comparing analyzed fields with Satellite images  |