**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 data  web 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 |