- ATM 651
  - Statistical dynamics
    - Coupled phenomena
    - Zonal mean and eddies
      - Momentum flux [u*v*] drives
      - Zonal PGF vanishes
    - Time mean and anomalies (or ‘transients’)
      - Anomaly covariance [w’T’] is eddy or transient heat flux
      - partial_t = conv(flux) or =0 if you assume balance
  - Statistics
    - Joint PDFs
      - Mutual information
      - Covariances
        - Maximum Covariance “modes”
          - Rotated
          - Orthogonal
      - Marginal, conditional PDFs
    - PDF /histogram
      - Shannon information
      - Moments
        - Skewness
        - variance (stdev is sqrt)
        - Mean
    - Impacts (integrals)
      - Land: Precip, Evap, hydrology
      - Ocean
        - Wind stress
        - Freshwater flux
    - Extremes (quantiles)
  - Phenomena
  - Model products (& observations)
  - Numerical models: see MindMap Atmosphere.mm
  - THE GAP (explicit models help)
  - Logic: stability, waves, balance maintenance
    - Momentum (vort) instabilities
    - Stratification and lifted-parcel instability
    - Ageostrophic in QG theory
  - Conservation laws d/dt = 0 + sources-sinks (“tendencies”)
  - Transport tendencies in d/dt
  - Continuity of mass in space-time
  - Vector calculus
  - Partial and total derivatives
  - Quantities and Units