**M.Sc. Meteorology**

**M -302/ PO-302 Air-Sea Interaction**

### Unit-I:

The significance of Air-Sea Interaction; Atmospheric and Oceanic Interaction at various scales; Concept of Boundary Layer. Barrier Layer, surface Layer, Ekman Layer, Upper ocean boundary layer Atmospheric Heat Budget. Oceanic heat budget.

### Unit-II:

Estimation of Air-sea fluxes: Drag coefficient, wind stress, heat and moisture exchange coefficients, bulk formula for momentum flux, sensible heat flux and latent heat flux, Physical interaction between the ocean and atmosphere; Oceanic impact on the marine atmospheric circulation.

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**Unit-III**

The Origin of Wind Waves, Properties of Instability Waves, Buoyancy Driven Instability and Kelvin-Helmholtz Instability, TKE equation : Mean Flow KE and PE equations. The Breaking of Waves, Momentum Transfer in a Breaking Wave.

**Unit IV:**

Mixed Layers in Contact**:** Mixed Layers, Thermoclines, and Hot Towers, Thermodynamics of atmospheric hot towers. Mixed Layer Turbulence , Laws of Entrainment, Oceanic mixed layers, equatorial upwelling, Oceanic deep convection.

### Unit-V:

Large Scale Air-Sea Interaction: Ocean – Atmosphere interaction in tropics; Characteristics of ENSO; ENSO and Air – Sea coupling; ENSO and the Indian Monsoon, Warm Pool in Indian and Pacific Oceans

**Text Books:**

1. Atmosphere – Ocean Dynamics, Adrian E. Gill, 1992.
2. Climate and Circulation of the Tropics, S. Hasternath, 1988.
3. The Oceans and climate by G.R.Bigg, 1996.
4. Ocean – Atmosphere interaction and climate modeling, Beris A. Kagan, 1995
5. Air-Sea Interaction Law and Mechanisms by G.T. Csanady