**M.Sc. Meteorology**

**M-304: Tropical Meteorology**

**Unit -I:**

Global perspective of monsoon, CTCZ, ITCZ over Indian ocean - structure and movement, 5-7 day, 30-50 day oscillations (MJO), 10-20 day oscillations. Regional circulation systems: Jet streams and their characteristics, Easterly waves-structure and movement, Trade wind inversion.

**Unit II**

Monsoon variability: Inter annual variability and decadal variability, Teleconnections of Indian summer monsoon with southern oscillation, El-Nino, La Nina, Indian Ocean dipole mode, NAO, Arctic Oscillation and Antarctica Oscillation, Reversal of monsoon system, winter monsoon.

**Unit -III:**

Monsoon rain bearing systems: Monsoon trough/CTCZ, Depressions, onset vortex, Mechanism of formation, structure and dynamics; Monsoon Elements; monsoon mesoscale process, seasonal prediction and predictability of monsoon, coupled monsoon system, the role of ocean in the life cycle of Indian monsoon system. ICRP programs with special reference to Indian Monsoon dynamics. Monsoon Index, Monsoon Mission.

**Unit-IV:**

Tropical cyclones: structure and mechanics – Life cycle, surface and upper air structures, budgets of momentum and energy, formation and movement – variability of hurricane intensity, Impact of global warming on the frequency of tropical cyclones

**Unit-V**

Thunder storms – CAPE and CINE, Favourable conditions for severe thunderstorms, influence of vertical wind shear, stability indices, Life cycle and structure of thunderstorm, Dust storm(Andhi), Kalabaisaki, Hail storm.

Tornadoes: Tornadoes in Indian subcontinent, structure of Tornado

**Text books:**

1. Weather analysis and forecasting- Vol.1 and 2 by B.Petterson
2. Tropical meteorology by H. Reihl
3. Climate and Weather in tropics - H. Reihl
4. Climate and circulation of the tropics by S. Hasternath
5. Tropical Meteorology by G.C. Asnani.
6. Monsoon Meteorology P.K Das.
7. The physics of the monsoon R. N. Keshava Murthy and M. Sankar Rao
8. The Asian Monsoon- Bin Wang