

Programme: M. Sc. (Marine Sciences)

Course Code: MSO 364

Title of the Course: Ocean Atmosphere Coupling and Climate Practical

Number of Credits: 02

Effective from AY: June, 2018-19

Prerequisites for the course:	Physical Oceanography	
Objective:	To analyze air-sea fluxes and the factors responsible, relationship between SST and southwest Indian monsoon, analyze El Nino and La Nina events	
Content:	Module – I 1. Data extraction from global data sets of Short Wave Radiation and analysis of its distribution (6hrs; Ref 1, 2, 3,4) 2. Data extraction from global data sets of Long Wave Radiation and analysis of its distribution (6hrs; Ref 1, 2, 3,4) 3. Data extraction from global data sets of Sensible Heat flux and analysis of its distribution (6hrs; Ref 1, 2, 3,4) 4. Data extraction from global data sets of Latent Heat Flux and analysis of its distribution (6hrs;	24 hours
	- Ref 1, 2, 3,4) 5. Estimation of Net heat flux from above extracted data sets and analysis of its distribution (6hrs; Ref 1, 2, 3,4) 6. Analysis of fluxes over Central Pacific during Normal, El-Nino and La Nina events (6hrs; Ref5) Module – II 1. Arabian Sea SST and Indian Summer rainfall correlation (6hrs; Ref6) 2. Central Pacific SST and Indian Summer rainfall correlation (6hrs; Ref6) 3. Cyclone intensity estimation using Dvorak technique for satellite images (8hrs; Ref 6,7) 4. Determination and analysis of cyclone tracks in Arabian Sea and Bay of Bengal (6hrs; Ref6) 5. Analysis of annual variations of N and S hemispheric air temperature (4hrs; Ref3)	24 hours
Pedagogy:	Tutorials/ assignments/practicals	
References/ Readings	1. The Physics of marine atmosphere, 1965 –Roll, H.U., Academic Press, London. 2. Oceanography for meteorologists, 1945 –Sverdrup, H.U., George Allen & Unwin, London, U.K. 3. Climate change, 1995 –Houghton, J.T., Cambridge Univ. Press, U.K. 4. Atlas of Surface Marine Data 1994, Volume 1: Algorithms and Procedures, 1994 - A. da Silva, A. C. Young, S. Levitus, No. 6.Department of Commerce, NOAA, NESDIS. 5. Air -sea fluxes from ICOADS: the construction of a new gridded dataset with uncertainty estimate, 2011 - Berry, D. I., and E. C. Kent, International Journal of Climatology, 31, 987 -1001: DOI: 10.1002/joc.2059. 6. Tropical Meteorology, 2005 - Asnani G C. 7. The Dvorak Tropical Cyclone Intensity Estimation Technique: A Satellite-Based Method that Has Endured for over 30 Years, 2006 - . Velden, Christopher, and Co-authors, <i>Bull. Amer. Meteor. Soc.</i>, 87,1195–1210.	
Learning Outcomes	Examine statistical relationship between El Nino and southwest Indian Monsoon, Explain spatiotemporal variability of fluxes and the possible governing factors.	