

Semester	AUG 2022
Open to semester	21
Course code	EC6382
Course title	Fundamentals of Climate Science
Credits	/2
Course Coordinator & participating faculty (if any)	Neena Joseph Mani
Nature of Course	Lectures
Pre-requisites	None
Objectives (goals, type of students for whom useful, outcome etc)	This course provides an overview of the Earth's Climate system and the various forcing and feedbacks controlling the Earth's climate variability in short and long timescale. It will also give a brief introduction to the atmosphere and ocean circulation.
Course contents (details of topics /sections with no. of lectures for each)	Planetary Energy balance, daily and seasonal variability, climate forcing Formation and evolution of Earth's atmosphere, Composition, Thermal and dynamical structure of Earth's atmosphere, Interaction of radiation with atmospheric gases, Greenhouse effect Temperature, salinity and density variation in the oceans, wind driven circulation, surface currents, Ekman transport, subtropical gyres, upwelling, downwelling Thermohaline circulation, deep water masses, North Atlantic Deep Water, Antarctic Bottom water, Climate impact of Thermohaline circulation. Earth's Climate variability on short and long time scales, Tectonic scale climate change, Orbital variations, Milankovitch cycles
Evaluation /assessment	End-Sem Examination-% Mid-Sem Examination-% Others-%
Suggested readings (with full list of authors, publisher, year, edn etc.)	1. The Earth System, 3rd Edition (2009), by LR. Kump, JF. Kasting and RG. Crane, Pearson. 2. Earths Climate: Past and Future, 2nd Edition (2008) by William F. Ruddiman, W.H. Freeman. 3. Atmospheric Science: An Introductory Survey, 2nd Edition

(2006), by JM. Wallace and PV. Hobbs, Academic Press.