

Semester	AUG 2022
Open to semester	5,7,21
Course code	EC3323/EC6374
Course title	Hydrology
Credits	3 /4
Course Coordinator & participating faculty (if any)	Argha Banerjee
Nature of Course	Lectures
Pre-requisites	elementary calculus, computer programming
Objectives (goals, type of students for whom useful, outcome etc)	This is an introductory course about water in our world, focusing on the physics of various hydrological processes that makes up the hydrological cycle. The approach will be quantitative. Global problems related to water would also be touched upon.
Course contents (details of topics /sections with no. of lectures for each)	<p>* Hydrological cycle: (6 L) Hydrological cycle (with some India-specific data and discussions).; global reservoirs, fluxes, and residence time; energy/mass balance; water vapor in the atmosphere, Precipitation and its variability, interception, infiltration; evapo-transpiration, energy/water limited cases, Budyko curve; soil moisture, ground water, surface water; measurement methods.</p> <p>* Stream Flow: (8 L) Effective rainfall, surface flow/overland flow. Linear reservoir model; Streamflow routing, runoff generation; stream flow and hydrograph. Unit and synthetic hydrographs. St Venant's equation;</p> <p>* Ground water: (8 L) Flow through porous media; soil moisture; infiltration; groundwater recharge. Flow of ground water; aquifers; anisotropy; wells. Diffusion equation for water table; steady solutions of diffusion equation; Measurement methods.</p> <p>* tools and models: (4 L)</p>

	GIS tools; conceptual numerical models; Introduction to the structures of some relatively simple hydrological models (eg VIC). Global water trends and climate-change effects.
Evaluation /assessment	End-Sem Examination-40% Mid-Sem Examination-30% Others-30 (quizzes+group projects)%
Suggested readings (with full list of authors, publisher, year, edn etc.)	<ol style="list-style-type: none"> 1. Applied hydrogeology, 4th Edition (2000), by Fetter, Pearson. 2. Applied Hydrology, (1988), by Ven Chow, David Maidment and Larry Mays, McGraw-Hill. 3. Groundwater hydrology, (2004), by Todd and Mays, Wiley.