

ECOHYDROLOGY

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Introduction: Origin and scope of ecohydrology. (03 Lectures) Ecohydrological processes: Interactions between physical, chemical and biological processes at basin scale soil water dynamics, land surface energy budgets; scales of interactions; ecohydrological optimality theory; ecohydrological controls on nutrient cycle; Landscape connectivity morphological, ecological and hydrological connections. (12 Lectures) Techniques in ecohydrological measurements: Measuring energy and water fluxes in atmosphere, soil and vegetation; atmosphere latent, sensible and CO₂ fluxes, distribution of wind, temperature and humidity; soil moisture, soil respiration and soil heat flux; vegetation leaf area index, stomatal conductance and transpiration. (08 Lectures) Ecohydrological modelling: Governing equations; mathematical models stochastic and deterministic models; process based and empirical models; calibration and validation of models; scale issues in ecohydrological modelling. (10 Lectures) Applications of ecohydrology: Use of ecohydrological principles in paleohydrology and climate change studies; ecohydrological approach for sustainable management of floods and droughts; case studies from tropical river basins and dry land ecosystems. (08 Lectures)